

## **Request for Information (RFI) for Radar Equipment Procurement for the Department of Fisheries and Oceans (DFO)**

F7048-160039

The Department of Fisheries and Oceans (DFO) for the Canadian Coast Guard (CCG) has a requirement to acquire and deploy coastal RADAR equipment; to replace aging coastal RADAR equipment currently used at twenty-three (23) operational RADAR sites and nine (9) Marine Communications and Traffic Services (MCTS) Centres across Canada and at the CCG College, Sydney, Nova Scotia (NS); to add RADAR equipment to the CCG operational network integration laboratory at Québec City, Québec (QC); and to add equipment at eleven (11) new RADAR sites and one (1) additional MCTS Centre.

This Request for Information (RFI) will allow the project:

- to present draft RFP documents to industry and solicit comments and feedback; and
- to answer questions from industry to ensure all interested participants receive the same information.

See attached draft solicitation documents for further information.

This is neither a call for tender nor a Request for Proposal (RFP), and no agreement or contract for the procurement of the equipment and / or services stated herein will be entered into solely as a result of this RFI. This announcement does not constitute a commitment by Canada. Canada does not intend to award a contract on the basis of the notice or otherwise pay for the information solicited. Any and all expenses incurred by industry in pursuing this opportunity, including the provision of information and potential visits, are at industry's sole risk and expense.

Any discussions on this subject with project staff representing DFO or PWGSC, or any other Government of Canada representative, or other personnel involved in project activities, shall not be construed as an offer to purchase or as commitment by DFO, PWGSC or Government of Canada as a whole.

Although the documents / information / data collected may be provided as commercial-in-confidence and will not be provided to a third party outside of Canada, Canada reserves the right to use the information to assist them in drafting performance specifications and for budgetary purposes. Requirements are subject to change, which may be as a result of information provided in response to this RFI. Suppliers are advised that any information submitted to Canada in response to this RFI may, or may not, be used by Canada in the development of the potential subsequent RFP. The issuance of this RFI does not create an obligation for Canada to issue a subsequent RFP, and does not bind Canada legally or otherwise, to enter into any agreement or to accept or reject any suggestions.

There will be no short-listing of Suppliers for the purposes of undertaking any future work, as a result of this RFI. Similarly, participation in this RFI is not a condition or prerequisite for the participation to any RFP.

Respondents to this RFI should identify any submitted information that is to be considered as either company confidential, proprietary or if the response contains controlled goods.

### **POLICY**

This requirement falls under the Federal Supply Classification (FSC) N5825 Radio Navigation Equipment, Except Airborne and is exempt from the provisions of the World Trade Organization - Agreement on Government Procurement (WTO-AGP), the North American Free Trade Agreement (NAFTA), the Canada-European Union Comprehensive Trade Agreement (CETA), the Canada - Chile Free Trade Agreement (CCFTA), and the Canada - Peru Free Trade Agreement (CPFTA).

This requirement is subject to the provisions of the Canadian Free Trade Agreement (CFTA).

Provisions of the Comprehensive Land Claims agreements (CLCAs) apply as two delivery locations are subject to two Comprehensive Land Claims Agreements, as follows:

- 1) Maa-nulth Final Agreement
- 2) Tsawwassen Final Agreement

Canadian Content Policy applies and the solicitation will be conditionally limited.

Competitive Procurement Strategy; all interested suppliers may submit a bid.

As per policy requirements all notices posted on Buy and Sell will be in both official languages.

#### INQUIRIES

Public Works and Government Services Canada

Land and Aerospace Equipment Procurement and Support Sector - QF

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## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirements**

1. Before award of a contract, the following conditions must be met:
  - (a) the Bidder must hold a valid organization security clearance as indicated in Part 6 - Resulting Contract Clauses;
  - (b) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work sites must meet the security requirements as indicated in Part 6 - Resulting Contract Clauses;
  - (c) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites;
2. Bidders are reminded to obtain the required security clearance promptly. Any delay in the award of a contract to allow the successful Bidder to obtain the required clearance will be at the entire discretion of the Contracting Authority.
3. For additional information on security requirements, Bidders should refer to the [Contract Security Program](http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) of Public Works and Government Services Canada (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html>) website.

### **1.2 Statement of Work**

The Work to be performed is detailed under Article 6.2 of the resulting contract clauses.

### **1.3 Comprehensive Land Claims Agreements**

This procurement is subject to the following Comprehensive Land Claims Agreements:

Maa-nulth First Nations Final Agreement

Tsawwassen First Nation Final Agreement

### **1.4 Debriefings**

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

### **1.5 Trade Agreements**

The requirement is subject to the provisions of the Canadian Free Trade Agreement (CFTA).

### **1.6 Canadian Content**

The requirement is subject to a preference for Canadian goods and/or services.

## PART 2 - BIDDER INSTRUCTIONS

### 2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2018-05-22) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of [2003](#), Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days

Insert: 180 days

### 2.2 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

### 2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than fifteen (15) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

### 2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

## PART 3 - BID PREPARATION INSTRUCTIONS

### 3.1 Bid Preparation Instructions

Due to the nature of the bid solicitation, bids transmitted by epost Connect service will not be accepted.

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (3 hard copies and 5 soft copies on CD and / or DVD)

Section II: Financial Bid (1 hard copy and 1 soft copy on CD and / or DVD)

Section III: Certifications (1 hard copy)

Section IV: Additional Information (1 hard copy)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that Bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

#### Section I: Technical Bid

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

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## Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Schedule A Pricing.

### 3.1.1 Exchange Rate Fluctuation Risk Mitigation

The Bidder may request Canada to assume the risks and benefits of exchange rate fluctuations. If the Bidder claims for an exchange rate adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form [PWGSC-TPSGC 450](#), Claim for Exchange Rate Adjustments with its bid, indicating the Foreign Currency Component (FCC) in Canadian dollars for each line item for which an exchange rate adjustment is required.

The FCC is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuations. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.

The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provision in the contract. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease).

At time of bidding, the Bidder must complete columns (1) to (4) on form [PWGSC-TPSGC 450](#), for each line item where they want to invoke the exchange rate fluctuation provision. Where bids are evaluated in Canadian dollars, the dollar values provided in column (3) should also be in Canadian dollars, so that the adjustment amount is in the same currency as the payment.

Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this exchange rate fluctuation provision.

## Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.

## Section IV: Additional Information

**3.1.2** SACC Manual clause [A9033T](#) (2012-07-16) Financial Capability

## PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

### 4.1 Evaluation Procedures

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.
- (c) **Phased Bid Compliance Process (PBCP)**

#### General



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Canada is conducting the PBCP described below for this requirement.

Notwithstanding any review by Canada at Phase I or II of the PBCP, Bidders are and will remain solely responsible for the accuracy, consistency and completeness of their Bids and Canada does not undertake, by reason of this review, any obligations or responsibility for identifying any or all errors or omissions in Bids or in responses by a Bidder to any communication from Canada.

THE BIDDER ACKNOWLEDGES THAT THE REVIEWS IN PHASE I AND II OF THIS PBCP ARE PRELIMINARY AND DO NOT PRECLUDE A FINDING IN PHASE III THAT THE BID IS NON-RESPONSIVE, EVEN FOR MANDATORY

REQUIREMENTS WHICH WERE SUBJECT TO REVIEW IN PHASE I OR II AND NOTWITHSTANDING THAT THE BID HAD BEEN FOUND RESPONSIVE

IN SUCH EARLIER PHASE. CANADA MAY DEEM A BID TO BE NON-RESPONSIVE TO A MANDATORY REQUIREMENT AT ANY PHASE.

THE BIDDER ALSO ACKNOWLEDGES THAT ITS RESPONSE TO A NOTICE OR A COMPLIANCE ASSESSMENT REPORT (CAR) (EACH DEFINED BELOW) IN PHASE I OR II MAY NOT BE SUCCESSFUL IN RENDERING ITS BID RESPONSIVE TO THE MANDATORY REQUIREMENTS THAT ARE THE SUBJECT OF THE NOTICE OR CAR, AND MAY RENDER ITS BID NON-RESPONSIVE TO OTHER MANDATORY REQUIREMENTS.

Canada may, in its discretion, request and accept at any time from a Bidder and consider as part of the Bid, any information to correct errors or deficiencies in the Bid that are clerical or administrative, such as, without limitation, failure to sign the Bid or any part or to checkmark a box in a form, or other failure of format or form or failure to acknowledge; failure to provide a procurement business number or contact information such as names, addresses and telephone numbers; inadvertent errors in numbers or calculations that do not change the amount the Bidder has specified as the price or of any component thereof that is subject to evaluation. This shall not limit Canada's right to request or accept any information after the bid solicitation closing in circumstances where the bid solicitation expressly provides for this right. The Bidder will have the time period specified in writing by Canada to provide the necessary documentation. Failure to meet this deadline will result in the Bid being declared non-responsive.

The PBCP does not limit Canada's rights under Standard Acquisition Clauses and Conditions (SACC) 2003 (2017-04-27) Standard Instructions – Goods or Services – Competitive Requirements nor Canada's right to request or accept any information during the solicitation period or after bid solicitation closing in circumstances where the bid solicitation expressly provides for this right, or in the circumstances described in subsection (c).

Canada will send any Notice or CAR by any method Canada chooses, in its absolute discretion. The Bidder must submit its response by the method stipulated in the Notice or CAR. Responses are deemed to be received by Canada at the date and time they are delivered to Canada by the method and at the address specified in the Notice or CAR. An email response permitted by the Notice or CAR is deemed received by Canada on the date and time it is received in Canada's email inbox at Canada's email address specified in the Notice or CAR. A Notice or CAR sent by Canada to the Bidder at any address provided by the Bidder in or pursuant to the Bid is deemed received by the Bidder on the date it is sent by Canada. Canada is not responsible for late receipt by Canada of a response, however caused.

#### **Phase I: Financial Bid**

After the closing date and time of this bid solicitation, Canada will examine the Bid to determine whether it includes a Financial Bid and whether any Financial Bid includes all information required by the solicitation. Canada's review in Phase I will be limited to identifying whether any information that is required under the bid solicitation to be included in the Financial Bid is missing from the Financial Bid. This review will not assess whether the Financial Bid meets any standard or is responsive to all solicitation requirements.

Canada's review in Phase I will be performed by officials of the Department of Public Works and Government Services.

If Canada determines, in its absolute discretion that there is no Financial Bid or that the Financial Bid is missing all of the information required by the bid solicitation to be included in the Financial Bid, then the Bid will be considered non-responsive and will be given no further consideration.

For Bids other than those described in c), Canada will send a written notice to the Bidder ("Notice") identifying where the Financial Bid is missing information. A Bidder, whose Financial Bid has been found responsive to the requirements that are reviewed at Phase I, will not receive a Notice. Such Bidders shall not be entitled to submit any additional information in respect of their Financial Bid.

The Bidders who have been sent a Notice shall have the time period specified in the Notice (the "Remedy Period") to remedy the matters identified in the Notice by providing to Canada, in writing, additional information or clarification in response to the Notice. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the Notice.

In its response to the Notice, the Bidder will be entitled to remedy only that part of its Financial Bid which is identified in the Notice. For instance, where the Notice states that a required line item has been left blank, only the missing information may be added to the Financial Bid, except that, in those instances where the addition of such information will necessarily result in a change to other calculations previously submitted in its Financial Bid, (for example, the calculation to determine a total price), such necessary adjustments shall be identified by the Bidder and only these adjustments shall be made. All submitted information must comply with the requirements of this solicitation.

Any other changes to the Financial Bid submitted by the Bidder will be considered to be new information and will be disregarded. There will be no change permitted to any other Section of the Bidder's Bid. Information submitted in accordance with the requirements of this solicitation in response to the Notice will replace, in full, **only** that part of the original Financial Bid as is permitted above, and will be used for the remainder of the bid evaluation process.

Canada will determine whether the Financial Bid is responsive to the requirements reviewed at Phase I, considering such additional information or clarification as may have been provided by the Bidder in accordance with this Section. If the Financial Bid is not found responsive for the requirements reviewed at Phase I to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.

Only Bids found responsive to the requirements reviewed in Phase I to the satisfaction of Canada, will receive a Phase II review.

## **Phase II: Technical Bid**

Canada's review at Phase II will be limited to a review of the Technical Bid to identify any instances where the Bidder has failed to meet any Eligible Mandatory Criterion. This review will not assess whether the Technical Bid meets any standard or is responsive to all solicitation requirements. Eligible Mandatory Criteria are all mandatory technical criteria that are identified in this solicitation as being subject to the PBCP. Mandatory technical criteria that are not identified in the solicitation as being subject to the PBCP, will not be evaluated until Phase III.

Canada will send a written notice to the Bidder (Compliance Assessment Report or "CAR") identifying any Eligible Mandatory Criteria that the Bid has failed to meet. A Bidder whose Bid has been found responsive to the requirements that are reviewed at Phase II will receive a CAR that states that its Bid has been found responsive to the requirements reviewed at Phase II. Such Bidder shall not be entitled to submit any response to the CAR.

A Bidder shall have the period specified in the CAR (the "Remedy Period") to remedy the failure to meet any Eligible Mandatory Criterion identified in the CAR by providing to Canada in writing additional or different information or clarification in response to the CAR. Responses received after the end of the Remedy Period will not be considered by Canada, except in circumstances and on terms expressly provided for in the CAR.

The Bidder's response must address only the Eligible Mandatory Criteria listed in the CAR as not having been achieved, and must include only such information as is necessary to achieve such compliance. Any additional information provided by the Bidder which is not necessary to achieve such compliance will not be considered by Canada, except that, in those instances where such a response to the Eligible Mandatory Criteria specified in the CAR will necessarily result in a consequential change to other parts of the Bid, the Bidder shall identify such additional changes, provided that its response must not include any change to the Financial Bid.

The Bidder's response to the CAR should identify in each case the Eligible Mandatory Criterion in the CAR to which it is responding, including identifying in the corresponding section of the original Bid, the wording of the proposed change to that section, and the wording and location in the Bid of any other consequential changes that necessarily result from such change. In respect of any such consequential change, the Bidder must include a rationale explaining why such consequential change is a necessary result of the change proposed to meet the Eligible Mandatory Criterion. It is not up to Canada to revise the Bidder's Bid, and failure of the Bidder to do so in accordance with this subparagraph is at the Bidder's own risk. All submitted information must comply with the requirements of this solicitation.

Any changes to the Bid submitted by the Bidder other than as permitted in this solicitation, will be considered to be new information and will be disregarded. Information submitted in accordance with the requirements of this solicitation in response to the CAR will replace, in full, **only** that part of the original Bid as is permitted in this Section.

Additional or different information submitted during Phase II permitted by this section will be considered as included in the Bid, but will be considered by Canada in the evaluation of the Bid at Phase II only for the purpose of determining whether the Bid meets the Eligible Mandatory Criteria. It will not be used at any Phase of the evaluation to increase or decrease any score that the original Bid would achieve without the benefit of such additional or different information. For instance, an Eligible Mandatory Criterion that requires a mandatory minimum number of points to achieve compliance will be assessed at Phase II to determine whether such mandatory minimum score would be achieved with such additional or different information submitted by the Bidder in response to the CAR. If so, the Bid will be considered responsive in respect of such Eligible Mandatory Criterion, and the additional or different information submitted by the Bidder shall bind the Bidder as part of its Bid, but the Bidder's original score, which was less than the mandatory minimum for such Eligible Mandatory Criterion, will not change, and it will be that original score that is used to calculate any score for the Bid

Canada will determine whether the Bid is responsive for the requirements reviewed at Phase II, considering such additional or different information or clarification as may have been provided by the Bidder in accordance with this Section. If the Bid is not found responsive for the requirements reviewed at Phase II to the satisfaction of Canada, then the Bid shall be considered non-responsive and will receive no further consideration.

Only Bids found responsive to the requirements reviewed in Phase II to the satisfaction of Canada, will receive a Phase III evaluation.

Concurrent with Phase II above, PWGSC will determine if there are two or more bids with a valid Canadian Content certification. In that event, once Phase II is complete for all bidders, the evaluation process will be limited to the bids with the certification; otherwise, all bids will complete the evaluation process. If two or more bids with a valid Canadian Content certification are received, and some of the bids with a valid certification are subsequently declared non-responsive, or are withdrawn, and less than two responsive bids with a valid certification remain, the evaluation process will continue among those bids with a valid certification. If all bids with a valid certification are subsequently declared non-responsive, or are withdrawn, then all the other bids received will complete the evaluation process.

### **Phase III: Final Evaluation of the Bid**

In Phase III, Canada will complete the evaluation of all Bids found responsive to the requirements reviewed at Phase II. Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.

A Bid is non-responsive and will receive no further consideration if it does not meet all mandatory evaluation criteria of the solicitation.

- d) All resulting contract document deliverables that need to be submitted in bid proposals for evaluation purposes are for evaluation purposes only, and will not be considered a delivered document under any resulting contract.

## **4.1.1 Technical Evaluation**

### **4.1.1.1 Mandatory Technical Criteria**

Mandatory evaluation criteria are included in the following documents:

Annex I Radar Equipment Procurements – Statement of Work - Bid Evaluation Matrix, Table 1  
Annex J Radar Transceiver and Antenna - Technical Statement of Requirements -Bid Evaluation Matrix, Section 1  
Annex K Radar Extractor / Tracker- Technical Statement of Requirements - Bid Evaluation Matrix, Section 1

The Phased Bid Compliance Process will apply to all mandatory technical criteria.

#### **4.1.1.2 Point Rated Technical Criteria**

Point Rated evaluation criteria are included in the following documents:

Annex I Radar Equipment Procurements – Statement of Work - Bid Evaluation Matrix, Table 2  
Annex J Radar Transceiver and Antenna - Technical Statement of Requirements -Bid Evaluation Matrix, Section 2  
Annex K Radar Extractor / Tracker- Technical Statement of Requirements - Bid Evaluation Matrix, Section 2

### **4.1.2 Financial Evaluation**

#### **4.1.2.1 Evaluation of Price - Canadian / Foreign Bidders**

The price of the bid will be evaluated as follows:

- a. Canadian-based bidders must submit firm prices, Canadian customs duties and excise taxes included, and Applicable Taxes excluded.
- b. foreign-based bidders must submit firm prices, Canadian customs duties and excise taxes included, and Applicable Taxes excluded.

Unless the bid solicitation specifically requires bids to be submitted in Canadian currency, bids submitted in foreign currency will be converted to Canadian currency for evaluation purposes. The rate given by the Bank of Canada in effect on the bid solicitation closing date, or on another date specified in the bid solicitation, will be applied as a conversion factor to the bids submitted in foreign currency.

Bids will be assessed on a DDP destination basis.

For the purpose of the bid solicitation, bidders with an address in Canada are considered Canadian-based bidders and bidders with an address outside of Canada are considered foreign-based bidders.

### **4.2 Basis of Selection**

#### **4.2.1 Basis of Selection - Highest Combined Rating of Technical Merit and Price**

1. To be declared responsive, a bid must:
  - a. comply with all the requirements of the bid solicitation; and
  - b. meet all mandatory criteria; and
  - c. obtain the required minimum of 25 points overall for the technical evaluation criteria which are subject to point rating.  
The rating is performed on a scale of 690 points.

2. Bids not meeting (a) or (b) or (c) will be declared non-responsive.
3. The selection will be based on the highest responsive combined rating of technical merit and price. The ratio will be 70 % for the technical merit and 30 % for the price.
4. To establish the technical merit score, the overall technical score for each responsive bid will be determined as follows: total number of points obtained / maximum number of points available multiplied by the ratio of 70%.
5. To establish the pricing score, each responsive bid will be prorated against the lowest evaluated price and the ratio of 30 %.
6. For each responsive bid, the technical merit score and the pricing score will be added to determine its combined rating.
7. Neither the responsive bid obtaining the highest technical score nor the one with the lowest evaluated price will necessarily be accepted. The responsive bid with the highest combined rating of technical merit and price, as determined by total extended price of Tables 1 through 3 of Schedule A Pricing, will be recommended for award of a contract.

The table below illustrates an example where all three bids are responsive and the selection of the contractor is determined by a 60/40 ratio of technical merit and price, respectively. The total available points equals 135 and the lowest evaluated price is \$45,000 (45).

#### Basis of Selection - Highest Combined Rating Technical Merit (60%) and Price (40%)

	Bidder 1	Bidder 2	Bidder 3
<b>Overall Technical Score</b>	115/135	89/135	92/135
<b>Bid Evaluated Price</b>	\$55,000.00	\$50,000.00	\$45,000.00
<b>Technical Merit Score</b>	115/135 x 60 = 51.11	89/135 x 60 = 39.56	92/135 x 60 = 40.89
<b>Calculations Pricing Score</b>	45/55 x 40 = 32.73	45/50 x 40 = 36.00	45/45 x 40 = 40.00
<b>Combined Rating</b>	83.84	75.56	80.89
<b>Overall Rating</b>	1st	3rd	2nd

## PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

## 5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

### 5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

### 5.1.2 Additional Certifications Required with the Bid

#### 5.1.2.1 Canadian Content Certification

This procurement is conditionally limited to Canadian goods and Canadian services.

Subject to the evaluation procedures contained in the bid solicitation, bidders acknowledge that only bids with a certification that the goods and services offered are Canadian goods and Canadian services, as defined in clause A3050T, may be considered.

Failure to provide this certification completed with the bid will result in the goods and services offered being treated as non-Canadian goods and non-Canadian services.

The Bidder certifies that:

- ( ) a minimum of 80 percent of the total bid price consist of Canadian goods and Canadian services as defined in paragraph 5 of clause A3050T.

For more information on how to determine the Canadian content for a mix of goods, a mix of services or a mix of goods and services, consult Annex 3.6.(9), Example 2, of the *Supply Manual* (<https://buyandsell.gc.ca/policy-and-guidelines/Supply-Manual>)

Specific to this requirement, the rules of origin covering HS 8516.29, RADAR Apparatus (RADAR System) require a change from any other subheading, including another subheading within that group. Radar System is defined in Annex B SOW. A RADAR system is comprised of the following major RADAR equipment components: RADAR Transceivers (HS 8529.90), RADAR Extractor/Tracker (8534.00), RADAR Antenna System (8529.10), RADAR Antenna Tower, and miscellaneous components including cabling, waveguides, active dehydrators, power supplies, remote control equipment, RADAR monitoring equipment (8471.41), etc. as applicable. For more information on Specific Rules of Origin, consult *NAFTA Rules of Origin Regulations, Schedule 1*

(<https://laws-lois.justice.gc.ca/eng/regulations/SOR-94-14/page-13.html#h-21>)

#### 5.1.2.1.1 SACC Manual clause [A3050T](#) (2014-11-27) Canadian Content Definition

## 5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

### 5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real procurement agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

### 5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's](https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#) website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#>).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](#)" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed Annex H titled Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

## PART 6 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

### 6.1 Security Requirements

**6.1.1** The following security requirements (SRCL and related clauses provided by the Contract Security Program) apply and form part of the Contract.

#### SECURITY REQUIREMENT FOR CANADIAN SUPPLIER:

1. The Contractor, at all times during the performance of the Contract/Standing Offer, hold a valid Designated Organization Screening (DOS), issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC).
2. The Contractor personnel requiring access to sensitive work site(s) must EACH hold a valid RELIABILITY STATUS, granted or approved by CISD/PWGSC.



3. Subcontracts which contain security requirements are NOT to be awarded without the prior written permission of CISD/PWGSC.
4. The Contractor must comply with the provisions of the:
  - a. Security Requirements Check List and security guide (if applicable), attached at Annex A;
  - b. *Industrial Security Manual* (Latest Edition).

#### SECURITY REQUIREMENT FOR FOREIGN SUPPLIER:

##### RELIABILITY, RESTRICTED SITE ACCESS

The Canadian Designated Security Authority (Canadian DSC) for industrial matters in Canada is the Industrial Security Sector (ISS), Public Works and Government Services Canada (PWGSC), administered by International Industrial Security Directorate (IIISD), PWGSC. The Canadian DSA is the authority for confirming **Contractor** compliance with the security requirements for foreign suppliers. The following security requirements apply to the foreign recipient **Contractor** incorporated or authorized to do business in a jurisdiction other than Canada and delivering outside of Canada the services listed and described in the subsequent **contract**.

1. The Foreign recipient **Contractor** must be from a Country within the North Atlantic Treaty Organization (NATO), the European Union (EU), or from a country with which Canada has an international bilateral security instrument. The Contract Security Program (CSP) has international bilateral security instruments with the countries listed on the following PWGSC website:  
<http://www.tpsgc-pwgsc.gc.ca/esc-src/international-eng.html>.
2. The Foreign recipient **Contractor** must provide proof that they are incorporated or authorized to do business in their jurisdiction.
3. The Foreign recipient **Contractor** shall not begin the work, services or performance until the Canadian Designated Security Authority (DSA) is satisfied that all contract security requirement conditions have been met. Canadian DSA confirmation must be provided, in writing, to the Foreign recipient **Contractor** in an Attestation Form, to provide confirmation of compliance and authorization for services to be performed.
4. The Foreign recipient **Contractor** must identify an authorized Contract Security Officer (CSO) and an Alternate (ACSO) (if applicable) to be responsible for the overseeing of the security requirements, as defined in this contract. This individual will be appointed by the proponent foreign recipient Contractor's Chief Executive officer or Designated Key Senior Official, defined as an owner, officer, director, executive, and or partner who occupy a position which would enable them to adversely affect the organization's policies or practices in the performance of the contract.
5. The Foreign recipient Contractor shall not permit access to Canadian restricted sites, except to its personnel subject to the following conditions:
  - a. Personnel have a need-to-know for the performance of the **contract**;
  - b. Personnel have been subject to a criminal record check, with favourable results, from a recognized governmental agency or private sector organization in **their country** as well as a Background Verification, validated by the Canadian DSA. The approved verifications for the required Criminal Record Check and Background Verification are listed at Appendix A;
  - c. The Foreign recipient **Contractor** shall ensure that personnel provide consent to share results of the Criminal record Background Check with the Canadian DSA and other Canadian Government Officials, if requested; and
  - d. The Government of Canada reserves the right to deny access to Canadian restricted sites to a foreign recipient **Contractor** for cause.

6. Subcontracts which contain security requirements are **NOT** to be awarded without the prior written permission of the Canadian DSA.
7. The Foreign recipient **Contractor** visiting Canadian Government, under this contract, will submit a Request for Site Access to the Departmental Security Officer of the Department of Fisheries and Oceans Canada.
8. In the event that a Foreign recipient **Contractor** is chosen as a supplier for this contract, subsequent country-specific foreign security requirement clauses must be generated and promulgated by the Canadian DSA, and provided to the Government of Canada Contracting Authority, to ensure compliance with the security provisions, as defined by the Canadian DSA, in relation to equivalencies.
9. The Foreign recipient **Contractor** must comply with the provisions of the Security Requirements Checklist attached at Annex A.

The Foreign recipient **Contractor** must perform a security screening of all its personnel who will need access to Canadian restricted sites:

- a) Identity Check:
  - i. Copies of two of valid original pieces of government issued identity documentation, one of which must include a photo;
  - ii. Surname (Last Name);
  - iii. Full given names;
  - iv. All other names used;
  - v. Gender;
  - vi. Date of birth;
  - vii. Place of birth (city, province/state/region, and country); and
  - viii. Citizenship(s).
- b) Residency Check
  - i. The last five (5) years of residency history starting from most recent with no gaps in time. Indicate if the person has resided in another country within the last five (5) years.
- c) Employment History Check
  - i. The last five (5) years of employment history starting from the most recent with no gaps in time.
- d) Criminal Record Check
  - i. Proof of criminal record check with favourable results for each country the person has resided in during the last five (5) years.

## 6.2 Statement of Work

The Contractor must perform the Work in accordance with Annex B Statement of Work and its Appendices, Annex C RADAR Transceiver and Antenna TSOR, Annex D Radar Extractor/Tracker TSOR and Annex E ITSG 33 Requirements.

## 6.3 Optional Goods and Services

The Contractor grants to Canada the irrevocable option to acquire the goods, services or both described at Schedule A Table 2 of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

For Items 18 through 21, Training, the Contracting Authority may exercise the option within 48 months after contract award by sending a written notice to the Contractor.

For Items 22 through 29, Equipment, the Contracting Authority may exercise the option for up to quantity 5 equipment configurations within 12 months after contract award, and for the balance within 84 months after contract award by sending a written notice to the Contractor.

For Items 30, 31, 32, 33, 34, 35, 36, Warranty, the Contracting Authority may exercise the option within 12, 24, 36, 48, 60, 72, 84 months after contract award respectively by sending a written notice to the Contractor.

For Item 37, Canadian Point of Contact, the Contracting Authority may exercise the option within 12 months after contract award by sending a written notice to the Contractor.

#### **6.4 Task Authorization**

A portion of the Work to be performed under the Contract (Schedule A Pricing items 38 through 41) will be on an "as and when requested basis" using a Task Authorization (TA). The Work described in the TA must be in accordance with the scope of the Contract. The Task Authorization process will be conducted in accordance with Annex G Task Authorization Process.

Additional Work that is not described in the Annex B Statement of Work but that is required to support the Radar Replacements and that would fall within the overall scope of the Work may be incorporated into the Contract through the issuance of a Task Authorization.

#### **6.5 Standard Clauses and Conditions**

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

##### **6.5.1 General Conditions**

[2010A](#) (2018-06-21), General Conditions - Goods (Medium Complexity) apply to and form part of the Contract.

Article 09, paragraph 1 of 2010A (2014-09-25) General Conditions - Goods (Medium Complexity) is amended as follows:

2010A 09 (2014-09-25) Warranty

Despite inspection and acceptance of the Work by or on behalf of Canada and without restricting any provisions of the Contract or any condition, warranty or provision imposed by law, the Contractor, if requested by Canada to do so, must replace, repair or correct, at its own option and expense any work that becomes defective or fails to conform to the requirements of the Contract, where applicable. The warranty period will be 12 months after delivery and acceptance of the Work or the length of the Contractor's or manufacturer's standard warranty period, whichever is longer.

The warranty period begins as follows:

i. For Schedule A, Pricing items 2 through 9, and should spares be purchased, Schedule A Pricing 15 through 17 and should the options be exercised, Schedule A, Pricing items 22 through 29, the warranty period commences following the successful completion of the Site Acceptance Test (SAT) of each individual Radar System;

ii. For and all other Goods and Services not mentioned above, the warranty will be 12 months after delivery and acceptance of the Work or the length of the Contractor's or manufacturer's standard warranty period, whichever is longer.

*For Schedule A Pricing Item 40 and Additional Work that is not described in the Annex B Statement of Work but that is required to support the Radar Replacements and that would fall within the overall scope of the Work only:*

1031-2 (2012-07-16), Contract Cost Principles, apply to and form part of the Contract.

## **6.5.2 Supplemental General Conditions**

4001 (2015-04-01), Hardware Purchase, Lease and Maintenance;  
4003 (2010-08-16), Licensed Software;  
4004 (2013-04-25), Maintenance and Support Services for Licensed Software; and  
4006 (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information, apply to and form part of the Contract.

## **6.6 Delivery**

### **6.6.1 Delivery and Installation of Equipment**

For Schedule A, Pricing, items 2 through 9, and should spares be purchased, Schedule A Pricing items 15 through 17, and should the options be exercised, Schedule A, Pricing, items 22 through 29:

For each installation, delivery of the equipment will be made to delivery points specified at the Radar Site Names of Section 4.2.3 of Annex B of the Contract in accordance with the project schedule as agreed to between Canada and the Contractor.

### **6.6.2 Delivery of Documentation and Data**

For Schedule A, Pricing, item 10:

All Documentation must be delivered in accordance with Annex B Appendix D, Contract Data Requirements List.

### **6.6.3 Delivery of Training**

For Schedule A, Pricing, items 11 through 14, and should the options be exercised, Schedule A, Pricing, items 18 through 21:

Technical Training must be conducted and completed prior six (6) months prior to the Radar Equipment installations. Operational Training must be conducted and completed within three (3) months prior to the Radar Equipment commissioning. Specific training dates will be agreed upon between Canada and the Contractor.

### **6.6.4 Comprehensive Land Claims Agreements**

The Contract is subject to the following Comprehensive Land Claims Agreements:

Maa-nulth First Nations Final Agreement

Tsawwassen First Nation Final Agreement.

## 6.7 Authorities

### 6.7.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Cindy Deck  
Title: Supply Team Leader  
Public Works and Government Services Canada  
Acquisitions Branch  
Directorate: Electronics, Munitions and Tactical Systems Procurement Directorate  
Address: 11 Laurier Street  
Gatineau, Quebec K1A 0S5  
Canada

Telephone: 819-420-4557  
Facsimile: 819-956-5650  
E-mail address: cindy.deck@tpsgc-pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

### 6.7.2 Technical Authority

The Technical Authority for the Contract is:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

The Technical Authority named above is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

### 6.7.3 Contractor's Representative

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Organization: \_\_\_\_\_  
Address: \_\_\_\_\_

Telephone: \_\_\_\_\_  
Facsimile: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

## **6.8 Payment**

### **6.8.1 Basis of Payment – Firm Price**

For Schedule A Pricing, items 1 through 14, and should spares be purchased, Schedule A Pricing items 15 through 17, and should the options be exercised, Schedule A, Pricing, items 18 through 37:

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price, for a cost of \$ (to be inserted at contract award). Customs duties are included and Applicable Taxes are extra.

For the firm price portion of the Work only, Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

### **6.8.2 Limitation of Expenditure - Cumulative Total of all Task Authorizations**

Schedule A Pricing Items 38 through 41, for all Task Authorizations issued under the Contract:

Canada's total liability to the Contractor under the Contract for all authorized Task Authorizations (TAs), inclusive of any revisions, must not exceed the sum of \$ (to be inserted at contract award), Customs duties are included and Applicable Taxes are extra.

No increase in the total liability of Canada will be authorized or paid to the Contractor unless an increase has been approved, in writing, by the Contracting Authority.

The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:

- a) when it is 75 percent committed; or
- b) four (4) months before the contract expiry date; or
- c) as soon as the Contractor considers that the sum is inadequate for the completion of the Work required in all authorized TAs, inclusive of any revisions, whichever comes first.

If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority, a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

### **6.8.3 Basis of Payment: - Firm Per Diem Rates - Task Authorizations**

The Contractor will be paid firm per diem rates in accordance with Schedule A Pricing Table 4, Items 38 through 41, for work performed in accordance with the Contract. Customs duties are included and Applicable Taxes are extra.

### **Travel and Living Expenses – National Joint Council Travel Directive**

The Contractor will be reimbursed its authorized travel and living expenses reasonably and properly incurred in the performance of the Work, at cost, without any allowance for profit and/or administrative overhead, in accordance with the meal, private vehicle and incidental expenses provided in Appendices

B, C and D of the [National Joint Council Travel Directive](#) and with the other provisions of the directive referring to "travellers", rather than those referring to "employees".

All travel must have the prior authorization of the Technical Authority through a signed Task Authorization.

All payments are subject to government audit.

#### **6.8.4 Canada's Obligation - Portion of the Work - Task Authorizations**

Canada's obligation with respect to the portion of the Work under the Contract that is performed through task authorizations is limited to the total amount of the actual tasks performed by the Contractor.

#### **6.8.5 Time Verification – Task Authorizations**

Time charged and the accuracy of the Contractor's time recording system are subject to verification by Canada, before or after payment is made to the Contractor. If verification is done after payment, the Contractor must repay any overpayment, at Canada's request.

#### **6.8.6 Taxes – Foreign-based Contractor**

Unless specified otherwise in the Contract, the price includes no amount for any federal excise tax, state or local sales or use tax, or any other tax of a similar nature, or any Canadian tax whatsoever. The price, however, includes all other taxes. If the Work is normally subject to federal excise tax, Canada will, upon request, provide the Contractor a certificate of exemption from such federal excise tax in the form prescribed by the federal regulations.

Canada will provide the Contractor evidence of export that may be requested by the tax authorities. If, as a result of Canada's failure to do so, the Contractor has to pay federal excise tax, Canada will reimburse the Contractor if the Contractor takes such steps as Canada may require to recover any payment made by the Contractor. The Contractor must refund to Canada any amount so recovered.

#### **6.8.7 Method of Payment**

##### **6.8.7.1 Milestone Payments**

For Schedule A Pricing items 1 through 14, and should spares be purchased, Schedule A Pricing items 15 through 17 and should the options be exercised, Schedule A Pricing items 18 through 37:

Canada will make milestone payments in accordance with the Schedule B Milestones detailed in the Contract and the payment provisions of the Contract if:

- a) an accurate and complete claim for payment using PWGSC-TPSGC 1111, Claim for Progress Payment (Annex F), and any other document required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b) all the certificates appearing on form PWGSC-TPSGC 1111, Claim for Progress Payment (Annex F), have been signed by the respective authorized representatives; and
- c) all Work associated with the milestone and as applicable any deliverable required has been completed and accepted by Canada.

##### **6.8.7.2 Method of Payment for Task Authorizations - Multiple Payments:**

Canada will pay the Contractor upon completion and delivery of units in accordance with the payment provisions of the Contract if:

- a. an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada;
- c. the Work delivered has been accepted by Canada.

## 6.9 Invoicing Instructions

The Contractor must submit a claim for payment using form PWGSC-TPSGC 1111, Claim for Progress Payment (Annex F). The claim can be submitted electronically via email and must be in a Portable Document Format (PDF).

Each claim must show:

*For all Milestones:*

- a) all information required on form PWGSC-TPSGC 1111, Claim for Progress Payment (Annex F);
- b) all applicable information detailed under the section entitled "Invoice Submission" of the general conditions;
- c) the description and value of the milestone(s) claimed as detailed in the Schedule B Payment Milestones.

*For all Task Authorizations:*

- d) a list of all expenses (if applicable);
- e) for all claims for travel, a copy of the invoices, receipts, vouchers for all direct expenses, travel and living expenses.

The Contractor must prepare and certify one copy of the claim on form PWGSC-TPSGC 1111, Claim for Progress Payment (Annex F), and forward it to the Technical Authority identified under the section entitled "Authorities" of the Contract for appropriate certification after inspection and acceptance of the Work takes place.

The Technical Authority will then forward the claim to the Contracting Authority for certification and onward submission to the Payment Office for the remaining certification and payment action.

The Contractor must not submit claims until all Work identified in the claim is completed.

## 6.10 Exchange Rate Fluctuation Adjustment

The foreign currency component (FCC) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuation. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.

For each line item where a FCC is identified, Canada assumes the risks and benefits for exchange rate fluctuation, as shown in the Basis of Payment. For such items, the exchange rate fluctuation amount is determined in accordance with the provision of this clause.

The total price paid by Canada on each invoice will be adjusted at the time of payment. The exchange rate adjustment amount will be calculated in accordance with the following formula:



Exchange rate adjustment =  $FCC \times Qty \times (i_1 - i_0) / i_0$   
where formula variables correspond to:

**FCC**

Foreign currency component (per unit)

**Qty**

quantity of units

**$i_0$**

Initial exchange rate (CAN\$ per unit of foreign currency [for example US\$1]).


The initial exchange rate is set as the Bank of Canada rate on the solicitation closing date. The Bank of Canada publishes its rates each business day by 16:30 Eastern Time.


**$i_1$**

Exchange rate for adjustments (ERA) (CAN\$ per unit of foreign currency [for example US\$1]).

The Bank of Canada publishes its rates each business day by 16:30 Eastern Time.

- a. The ERA for goods will be the Bank of Canada rate on the date the goods were delivered.
- b. The ERA for services will be the Bank of Canada rate on the last business day of the month for which the services were performed.
- c. The ERA for advance payments will be the Bank of Canada rate on the last business day prior to the payment. The last published business day rate will be used for non-business days.

The Contractor must indicate the total exchange rate adjustment amounts (whether they are upward, downward or present no change) as a separate item on each invoice or claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their invoice form [PWGSC-TPSGC 450](#) , Claim for Exchange Rate Adjustments.

The exchange rate adjustment will only impact the payment to be made by Canada where the exchange rate fluctuation is greater than 2% (increase or decrease), calculated in accordance with column 8 of form [PWGSC-TPSGC 450](#)  (that is  $[i_1 - i_0] / i_0$ ).

Canada reserves the right to audit any revision to costs and prices under this clause

## 6.11 Certifications and Additional Information

### 6.11.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

### 6.11.2 Federal Contractors Program for Employment Equity - Default by the Contractor

The Contractor understands and agrees that, when an Agreement to Implement Employment Equity (AIEE) exists between the Contractor and Employment and Social Development Canada (ESDC)-Labour, the AIEE must remain valid during the entire period of the Contract. If the AIEE becomes invalid, the name of the Contractor will be added to the "[FCP Limited Eligibility to Bid](#)" list. The imposition of such a sanction by ESDC will constitute the Contractor in default as per the terms of the Contract.

## **6.12 Applicable Laws**

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

## **6.13 Priority of Documents**

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement and its Schedules;
- (b) the supplemental general conditions 4001 (2015-04-01), Hardware Purchase, Lease and Maintenance
- (c) the supplemental general conditions 4003 (2010-08-16), Licensed Software
- (d) the supplemental general conditions 4004 (2013-04-25), Maintenance and Support Services for Licensed Software;
- (e) the supplemental general conditions 4006 (2010-08-16), Contractor to Own Intellectual Property Rights in Foreground Information,
- (f) the general conditions 1031-2 (2012-07-16), Contract Cost Principles (if applicable as per Article 6.5)
- (g) the general conditions 2010A (2016-04-04), General Conditions - Goods (Medium Complexity);
- (h) Annex A, Security Requirements Check List;
- (i) Annex B, Radar Equipment Procurements - Statement of Work and its Appendices;
- (j) Annex C Radar Transceiver and Antenna – Technical Statement of Requirements;
- (k) Annex D Radar Extractor /Tracker – Technical Statement of Requirements;
- (l) Annex E Radar Equipment ITSG 33 Requirements;
- (m) Annex F Claim for Progress Payment
- (n) Annex G Task Authorization Process
- (o) the Contractor's bid dated \_\_\_\_\_ (to be inserted after contract award)

## **6.14 Shipping Instructions – Delivery Duty Paid**

Delivered Duty Paid (DDP) (locations defined in Annex B, Section 4.2.3, Radar Site Names) Incoterms 2000 for shipments from a commercial contractor.

## **6.15 Marking**

The Contractor must ensure that the manufacturer's name and part number are clearly stamped or etched on each item for positive identification purposes.

## **6.16 Labelling**

The Contractor must ensure that the manufacturer's and specification numbers appear on each item, either printed on the container or on an adhesive label of highest commercial standard affixed to the container.

## **6.17 Wood Packaging Materials**

All wood packaging materials used in shipping must conform to the [International Standards for Phytosanitary Measures No. 15: Regulation of Wood Packaging Material in International Trade \(ISPM 15\)](#).

Pertinent additional information on Canada's import and export programs is provided in the following Canadian Food Inspection Agency policy directives:

D-98-08 - [Entry Requirements for Wood Packaging Materials Produced in All Areas Other Than the Continental United States](#)

D-13-01 – [Canadian Heat Treated Wood Products Certification Program \(HT Program\)](#)

## **6.18 Dangerous Goods / Hazardous Products - Labelling and Packaging Compliance**

The Contractor must ensure proper labelling and packaging in the supply and shipping of dangerous goods/hazardous products to the Government of Canada.

The Contractor will be held liable for any damages caused by improper packaging, labelling or carriage of dangerous goods/hazardous products.

The Contractor must clearly mark all merchandise labels with the percentage of volume that is a hazardous item. Failure to do so will result in the Contractor being held responsible for damages caused in the movement of goods/products by government vehicles or government personnel.

The Contractor must adhere to all applicable laws regarding dangerous goods/hazardous products.

## **6.19 Inspection and Acceptance**

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Annex B, Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

## **6.20 Foreign Nationals**

For Canadian Bidders:

The Contractor must comply with Canadian immigration requirements applicable to foreign nationals entering Canada to work temporarily in fulfillment of the Contract. If the Contractor wishes to hire a foreign national to work in Canada to fulfill the Contract, the Contractor should immediately contact the nearest Service Canada regional office to enquire about Citizenship and Immigration Canada's requirements to issue a temporary work permit to a foreign national. The Contractor is responsible for all costs incurred as a result of non-compliance with immigration requirements.

For Foreign Bidders:

The Contractor must comply with Canadian immigration legislation applicable to foreign nationals entering Canada to work temporarily in fulfillment of the Contract. If the Contractor wishes to hire a foreign national to work in Canada to fulfill the Contract, the Contractor should immediately contact the nearest Canadian Embassy, Consulate or High Commission in the Contractor's country to obtain instructions, information on

Citizenship and Immigration Canada's requirements and any required documents. The Contractor is responsible to ensure that foreign nationals have the required information, documents and authorizations before performing any Work under the Contract in Canada. The Contractor is responsible for all costs incurred as a result of non-compliance with immigration requirements.

#### **6.21 Access to Facilities and Equipment**

Canada's facilities, equipment, documentation and personnel are not automatically at the disposal of the Contractor. If access to government premises, computer systems (micro computer network), working space, telephones, terminals, documentation and personnel for consultation is required by the Contractor to perform the Work, the Contractor must advise the Contracting Authority of the need for such access in a timely fashion. If the Contractor's request for access is approved by Canada and arrangements are made to provide access to the Contractor, the Contractor, its subcontractors, agents and employees must comply with all the conditions applicable at the Work site. The Contractor must further ensure that the facilities and equipment are used solely for the performance of the Contract.

#### **6.22 Insurance**

The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor from or reduce its liability under the Contract.

## SCHEDULE A

### PRICING

Customs duties are excluded and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable. Should a discrepancy exist between the unit and extended unit prices, the unit pricing will govern.

All prices provided in Schedule A, Pricing, are provided in Canadian Currency.

Table 1	Firm Price			
Item No	Description	Quantity	Firm Unit Price	Firm Extended Price
	<b>Project Management</b>			
1	Manage, deliver, and execute the Work for all aspects of the project, as defined in Annex B Acquisition Statement of Work and its appendices, Annex C Radar Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	lot		
	<b>Equipment</b>			
2	Radar Transceivers, in a dual redundant configuration, for deployment at the operational sites complete with all instructions, materials, parts and assemblies necessary for its installation and integration, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	68		
3	Radar Transceivers for each transceiver model for a dual system test setup at the CCG Test Laboratory, complete with all instructions, materials, parts and assemblies necessary for its installation, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, and Annex D Radar Extractor / Tracker TSOR.	2		
4	Radar Transceivers, in a dual redundant configuration, for the training setup at the CCG College, complete with all instructions, materials, parts and assemblies necessary for its installation	2		

	as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, and Annex D Radar Extractor / Tracker TSOR			
5	Set of Radar Extractor components for the operational sites, as per the RADAR Equipment configurations defined by the Contractor as required to interface the RADAR Transceiver and RADAR Antenna Systems at each of the remote sites with the corresponding MCTS Centre INNAV workstation, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, integration and operation, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	lot		
6	Set of Radar Extractor components for the test setup at the CCG Test Laboratory, complete with all instructions, materials, parts and assemblies necessary for its installation, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements..	1		
7	Set of Radar Extractor components for the CCG College training setup, complete with all instructions, materials, parts and assemblies necessary for its installation, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements..	1		
8	Radar Antenna Systems, complete with all instructions, materials, parts, assemblies, cables and power cords necessary for its installation and integration, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	31		
	OR			
8	Radar Antenna Systems, complete with all instructions, materials, parts, assemblies, cables and power cords necessary for its installation and integration, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33	36		

	Requirements.  (QTY 36 if the bidder elects to replace the antenna systems)			
9	Quantity of additional computing equipment as necessary for RADAR Maintenance and Information Display for deployment with the RADAR Equipment in the equipment building at each of the remote sites, the equipment rooms at each of the operations centres, the CCG Test Laboratory, the CCG College, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.	lot		
	<b>Documentation and Data</b>			
10	Generate and deliver the Manuals, Publications, Contract Data Requirements List and Data Item Descriptions as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	lot		
	<b>Training</b>			
11	Operational Course (English) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	3		
12	Operational Course (French) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	1		
13	Technical Course (English) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	8		
14	Technical Course (French) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	2		
	The estimated quantities cited below are for evaluation purposes			

Item No	Description	Estimated Quantity	Firm Unit Price	Extended Price for evaluation
	<b>Spares</b>			
15	Spare Radar Transceivers, complete with all instructions, materials, parts and assemblies necessary for its installation as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	5		
16	Spare set of Radar Extractor components, complete with all instructions, materials, parts and assemblies necessary for its installation as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	5		
17	Spare Radar Antenna Systems of various sizes, complete with all instructions, materials, parts and assemblies necessary for its installation as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	8		

Optional Requirements

Table 2	Optional, Firm prices			
Item No	Description	Quantity	Firm Unit Price	Firm Extended Price
	<b>Training</b>			
18	Operational Course (English) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	8		
19	Operational Course (French) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	2		
20	Technical Course (English) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements	8		
21	Technical Course (French) as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and	2		



	Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements			
	<b>Equipment</b>			
<b>22</b>	RADAR Equipment Configuration for additional remote site deployment with associated MCTS centre equipment, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, Appendix F, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	1		
<b>23</b>	RADAR Equipment Configuration for additional remote site deployment with associated MCTS centre equipment, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, Appendix F, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	1		
<b>24</b>	RADAR Equipment Configuration for additional remote site deployment with associated MCTS centre equipment, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, Appendix F, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	1		
<b>25</b>	RADAR Equipment Configuration for additional remote site deployment with associated MCTS centre equipment, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, Appendix F, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	1		

26	RADAR Equipment Configuration for additional remote site deployment with associated MCTS centre equipment, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, Appendix F, and as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	1		
27	RADAR Antenna Systems with the capability to switch between horizontal and circular polarization if this capability is available for the various antenna sizes, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements..	31		
	OR			
27	RADAR Antenna Systems with the capability to switch between horizontal and circular polarization if this capability is available for the various antenna sizes, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements..  (QTY 36 if the bidder elects to replace the antenna systems)	36		
28	Signaling RACONS to inhibit transmission, as defined in the RADAR Transceiver and Antenna TSOR, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	36		
29	Mechanical lock which would prevent the Antennas at each of the remote sites from turning during maintenance occurrences with a person aloft, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.	31		
	OR			

<b>29</b>	Mechanical lock which would prevent the Antennas at each of the remote sites from turning during maintenance occurrences with a person aloft, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor TSOR and Annex E ITSG 33 Requirements.  (QTY 36 if the bidder elects to replace the antenna systems)	36		
	<b>Warranty</b>			
<b>Item No</b>	<b>Description</b>	<b>Year #</b>	<b>Firm Unit (delivered system) price</b>	<b>Firm Extended Price (x 36 systems, for evaluation purposes)</b>
<b>30</b>	Additional warranty per delivered system with the same level of coverage as per contract	<b>1</b>		
<b>31</b>	Additional warranty with the same level of coverage as per contract	<b>2</b>		
<b>32</b>	Additional warranty with the same level of coverage as per contract	<b>3</b>		
<b>33</b>	Additional warranty with the same level of coverage as per contract	<b>4</b>		
<b>34</b>	Additional warranty with the same level of coverage as per contract	<b>5</b>		
<b>35</b>	Additional warranty with the same level of coverage as per contract	<b>6</b>		
<b>36</b>	Additional warranty with the same level of coverage as per contract	<b>7</b>		
	<b>Canadian Point of Contact</b>			
<b>Item No</b>	<b>Description</b>	<b>Quantity</b>	<b>Firm Unit Price</b>	<b>Firm Extended Price</b>
<b>37</b>	Single point of contact within Canada to which the CCG will forward defective or failed equipment for repair, for the duration of the expected in-service life of the deployed Radar Equipment.	<b>lot</b>		

	The estimated quantities cited below are for evaluation purposes			
<b>Table 3</b>	<b>Services – Task Authorization Level of Effort as determined per individual task</b>			
<b>Item No</b>	<b>Description</b>	<b>Quantity (days) for evaluation</b>	<b>Average per diem rate (Table 4)</b>	<b>Extended Price for evaluation</b>
<b>38</b>	Installation Service Support, SOW paragraph 4.2.3, as defined in Annex B Statement of Work	180		

	and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.			
<b>39</b>	Field Support Services, SOW paragraph 4.2.8, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	200		
<b>40</b>	Non Warranty Repairs, SOW paragraph 4.7.2, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	N/A to be negotiated via Task Authorization	n/a	n/a
<b>41</b>	Installation Service Support, SOW paragraph 5.1.3.1, as defined in Annex B Statement of Work and its Appendices, Annex C Transceiver and Antenna TSOR, Annex D Radar Extractor / Tracker TSOR and Annex E ITSG 33 Requirements.	340		

<b>Table 4</b>									
<b>Task Authorizations Firm per diem Labour rates</b>									
<b>Calendar Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>Average per diem</b>
<b>Service Item # (Table 3)</b>									
<b>38</b>									
<b>39</b>									
<b>40</b>									
<b>41</b>									

Firm per diem labour rates are fully burdened, inclusive of all direct labour, General & Administrative expense, overheads and profit.

Average per diem calculation as follows:

Item 38  $\{(per\ diem\ 2019 * 6) + (per\ diem\ 2020 * 7) + (per\ diem\ 2021 * 5) + (per\ diem\ 2022 * 3) + (per\ diem\ 2023 * 3) + (per\ diem\ 2024 * 5) + (per\ diem\ 2025 * 2) + (per\ diem\ 2026 * 5)\} * 1/36$

Item 39  $\{(per\ diem\ 2019 * 6) + (per\ diem\ 2020 * 7) + (per\ diem\ 2021 * 5) + (per\ diem\ 2022 * 3) + (per\ diem\ 2023 * 3) + (per\ diem\ 2024 * 5) + (per\ diem\ 2025 * 2) + (per\ diem\ 2026 * 5)\} * 1/36$

Item 40  $\{(per\ diem\ 2019) + (per\ diem\ 2020) + (per\ diem\ 2021) + (per\ diem\ 2022) + (per\ diem\ 2023) + (per\ diem\ 2024) + (per\ diem\ 2025) + (per\ diem\ 2026)\} * 1/8$

Item 41  $\{(per\ diem\ 2019 * 6) + (per\ diem\ 2020 * 7) + (per\ diem\ 2021 * 5) + (per\ diem\ 2022 * 3) + (per\ diem\ 2023 * 3) + (per\ diem\ 2024 * 5) + (per\ diem\ 2025 * 2) + (per\ diem\ 2026 * 5)\} * 1/36$

*Calculation for items 38-39 based on anticipated delivery.*

## SCHEDULE B

### MILESTONE SCHEDULE

1.				
From Items 1-20 from Schedule A				
Item No	Milestone	Description	% Total Contract Value	Milestone Value
1	Preliminary Design Review (PDR)	Successful completion of PDR including required action plans and resolutions, in accordance with SOW 4.4.9, as represented by approval of the PDR minutes.	1	
2	Critical Design Review (CDR)	Successful completion of CDR including required action plans and resolutions, in accordance with SOW 4.4.10, as represented by approval of the CDR minutes.	3	
3	INNAV Interface Readiness Review(IIRR) and INNAV Interface Test (IIT)	Successful completion of IIRR including required action plans and resolutions, in accordance with SOW 4.4.11 and 4.5.7, as represented by approval of the IIRR minutes.	3	
4	Spares Provisioning Meeting (SPM)and In-Service Support Review (ISSR)	Successful completion of SPM and ISSR including required action plans and resolutions, in accordance with SOW 4.4.12, 4.4.17, and 4.1.5 as represented by approval of the SPM and ISSR minutes.	2	
5	FAT Readiness Review (FRR)	Successful completion of FRR including required action plans and resolutions, in accordance with SOW 4.4.13, as represented by approval of the FRR minutes.	0.5	
6	Post FAT Review (PFR)	Successful completion of PFR including required action plans and resolutions, in accordance with SOW 4.4.14, as represented by approval of the PFR minutes.	0.5	
7	Training Readiness Review (TRR)	Successful completion of TRR including required action plans and resolutions, in accordance with SOW 4.4.15, as represented by approval of the TRR minutes.	1	
8	Technical Course	Successful completion of all Technical course sessions and obligations including required	1	

		resulting action plans and resolutions, in accordance with SOW 4.6, as represented by concurrence that all Technical course requirements have been met.		
9	Operational Course	Successful completion of all Operational course sessions and obligations including required resulting action plans and resolutions, in accordance with SOW 4.6, as represented by concurrence that all Operational course requirements have been met.	1	
10	Site Installation at CCG Test Laboratory	Successful completion of the Radar Equipment installation, in accordance with SOW 4.2.4, as represented by approval of the System Acceptance test report.	2	
11	Site Installation at CCG College	Successful completion of the Radar Equipment installation, in accordance with SOW 4.2.5, as represented by approval of the FAT report and confirmation by the Technical Authority that the equipment has been received in working order.	2	
12	Site Installation and Acceptance Test (SAT) – Arnolds Cove	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	3.1	
13	Site Installation and Acceptance Test (SAT) – Cuslett	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
14	Site Installation and Acceptance Test (SAT) – Pearce Peak	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
15	Site Installation and Acceptance Test (SAT) – Red Head	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.9	
16	Site Installation and Acceptance Test (SAT) – Tiverton	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.9	
17	Site Installation and Acceptance Test (SAT) – Eddy Point	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.7	
18	Site Installation and Acceptance Test (SAT) – Île	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6	1.5	

	Charron	and 4.5.8, as represented by approval of the SAT test report.		
19	Site Installation and Acceptance Test (SAT) – Lévis	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.2	
20	Site Installation and Acceptance Test (SAT) – Les Escoumins	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	0.9	
21	Site Installation and Acceptance Test (SAT) – Pont Jacques Cartier	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	0.9	
22	Site Installation and Acceptance Test (SAT) – Point Edward	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.5	
23	Site Installation and Acceptance Test (SAT) – Port aux Basques	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.6	
24	Site Installation and Acceptance Test (SAT) – Chebucto Head	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.8	
25	Site Installation and Acceptance Test (SAT) – Georges Island	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.4	
26	Site Installation and Acceptance Test (SAT) – Shannon Hill	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.5	
27	Site Installation and Acceptance Test (SAT) – Partridge Island	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.5	
28	Site Installation and Acceptance Test (SAT) – Mt. Newton	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	



29	Site Installation and Acceptance Test (SAT) – Mt. Parke	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.9	
30	Site Installation and Acceptance Test (SAT) – Mt. Ozzard	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	5	
31	Site Installation and Acceptance Test (SAT) – Berry Point	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.7	
32	Site Installation and Acceptance Test (SAT) – Kap 100	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.7	
33	Site Installation and Acceptance Test (SAT) – Bowen Island	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2	
34	Site Installation and Acceptance Test (SAT) – Mt. Helmcken	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
35	Site Installation and Acceptance Test (SAT) – Site A	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.5	
36	Site Installation and Acceptance Test (SAT) – Site B	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.6	
37	Site Installation and Acceptance Test (SAT) – Site C	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
38	Site Installation and Acceptance Test (SAT) – Site D	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.3	
39	Site Installation and Acceptance Test (SAT) – Site E	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT	2.6	

		test report.		
40	Site Installation and Acceptance Test (SAT) – Site F	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
41	Site Installation and Acceptance Test (SAT) – Site G	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
42	Site Installation and Acceptance Test (SAT) – Site H	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
43	Site Installation and Acceptance Test (SAT) – Site I	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	2.8	
44	Site Installation and Acceptance Test (SAT) – Site J	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.7	
45	Site Installation and Acceptance Test (SAT) – Site K	Successful completion of the FAT, installation and SAT including required resulting action plans and resolutions, in accordance with SOW 4.2.6 and 4.5.8, as represented by approval of the SAT test report.	1.4	
46	Documentation and Data	Successful completion of Documentation and Data delivery and obligations including required resulting action plans and resolutions, in accordance with the SOW and its CDRs and DIDs, as represented by approval of the Documentation and concurrence that requirements have been met.	4	
47	Warranty	Successful completion of Warranty obligations including required resulting action plans and resolutions, as represented by concurrence that all warranty obligations have been met.	1	
48	Final Program Review	Successful completion of Final Program Review obligations including required resulting action plans and resolutions, in accordance with SOW 4.2.18, as represented by approval of the Final Program Review minutes and concurrence that all required resolutions, action plans and action items have been completed and all requirements have been met.	5	

Solicitation No. - N° de l'invitation

F7048-160039 /C

Client Ref. No. - N° de réf. du client

F7048-160039

Amd. No. - N° de la modif.

File No. - N° du dossier  
117qf. F7048-160039

Buyer ID - Id de l'acheteur

117qf

CCC No./N° CCC - FMS No./N° VME

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## 2. Spares and Optional Requirements

*(To be negotiated if options are exercised)*

DRAFT

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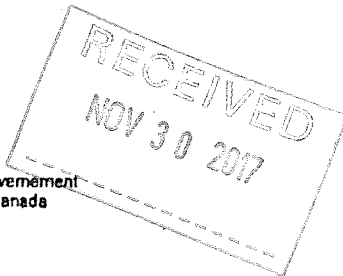
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**SECURITY REQUIREMENTS CHECK LIST (SRCL)  
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)**

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE		
1. Originating Government Department or Organization Ministère ou organisme gouvernemental d'origine <b>CCG</b>		2. Branch or Directorate / Direction générale ou Direction <b>ITS</b>
3. a) Subcontract Number / Numéro du contrat de sous-traitance		3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant
4. Brief Description of Work - Brève description du travail <b>Replace Radar Systems at CCG's communication sites.</b>		
5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui
6. Indicate the type of access required - Indiquer le type d'accès requis		
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p.ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.		<input type="checkbox"/> No Non <input checked="" type="checkbox"/> Yes Oui
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciales sans entreposage de nuit?		<input checked="" type="checkbox"/> No Non <input type="checkbox"/> Yes Oui
7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès		
Canada <input type="checkbox"/>	NATO / OTAN <input type="checkbox"/>	Foreign / Étranger <input type="checkbox"/>
7. b) Release restrictions / Restrictions relatives à la diffusion		
No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>	All NATO countries Tous les pays de l'OTAN <input type="checkbox"/>	No release restrictions Aucune restriction relative à la diffusion <input type="checkbox"/>
Not releasable À ne pas diffuser <input type="checkbox"/>	Restricted to: / Limité à <input type="checkbox"/>	Restricted to: / Limité à <input type="checkbox"/>
Specify country(ies): / Préciser le(s) pays:	Specify country(ies): / Préciser le(s) pays:	Specify country(ies): / Préciser le(s) pays:
7. c) Level of information / Niveau d'information		
PROTECTED A PROTÉGÉ A <input type="checkbox"/>	NATO UNCLASSIFIED NATO NON CLASSIFIÉ <input type="checkbox"/>	PROTECTED A PROTÉGÉ A <input type="checkbox"/>
PROTECTED B PROTÉGÉ B <input type="checkbox"/>	NATO RESTRICTED NATO DIFFUSION RESTREINTE <input type="checkbox"/>	PROTECTED B PROTÉGÉ B <input type="checkbox"/>
PROTECTED C PROTÉGÉ C <input type="checkbox"/>	NATO CONFIDENTIAL NATO CONFIDENTIEL <input type="checkbox"/>	PROTECTED C PROTÉGÉ C <input type="checkbox"/>
CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>	NATO SECRET NATO SECRET <input type="checkbox"/>	CONFIDENTIAL CONFIDENTIEL <input type="checkbox"/>
SECRET SECRET <input type="checkbox"/>	COSMIC TOP SECRET COSMIC TRÈS SECRET <input type="checkbox"/>	SECRET SECRET <input type="checkbox"/>
TOP SECRET TRÈS SECRET <input type="checkbox"/>		TOP SECRET TRÈS SECRET <input type="checkbox"/>
TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>		TOP SECRET (SIGINT) TRÈS SECRET (SIGINT) <input type="checkbox"/>

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PART A (continued) / PARTIE A (suite)

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets?  
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS? ☒ No ☐ Yes  
If Yes, indicate the level of sensitivity:  
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets?  
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate? ☒ No ☐ Yes

Short Title(s) of material / Titre(s) abrégé(s) du matériel :

Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

<input checked="" type="checkbox"/> RELIABILITY STATUS COTE DE FIABILITÉ	<input type="checkbox"/> CONFIDENTIAL CONFIDENTIEL	<input type="checkbox"/> SECRET SECRET	<input type="checkbox"/> TOP SECRET TRÈS SECRET
<input type="checkbox"/> TOP SECRET - SIGINT TRÈS SECRET - SIGINT	<input type="checkbox"/> NATO CONFIDENTIAL NATO CONFIDENTIEL	<input type="checkbox"/> NATO SECRET NATO SECRET	<input type="checkbox"/> COSMIC TOP SECRET COSMIC TRÈS SECRET
<input type="checkbox"/> SITE ACCESS ACCÈS AUX EMPLACEMENTS			

Special comments:  
Commentaires spéciaux :

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.  
REMARQUE: Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni

10. b) May unscreened personnel be used for portions of the work?  
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail? ☒ No ☐ Yes  
If Yes, will unscreened personnel be escorted?  
Dans l'affirmative, le personnel en question sera-t-il escorté? ☐ No ☐ Yes

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises?  
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS? ☒ No ☐ Yes

11. b) Will the supplier be required to safeguard COMSEC information or assets?  
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC? ☒ No ☐ Yes

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises?  
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ? ☒ No ☐ Yes

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data?  
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS? ☒ No ☐ Yes

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency?  
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale? ☒ No ☐ Yes

Security Classification / Classification de sécurité



PART C (continued) / PARTIE C (suite)

For users completing the form manually use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.

Les utilisateurs qui remplissent le formulaire manuellement doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form online (via the Internet), the summary chart is automatically populated by your responses to previous questions.

Dans le cas des utilisateurs qui remplissent le formulaire en ligne (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category Catégorie	PROTECTED PROTÉGÉ			CLASSIFIED CLASSIFIÉ			NATO				COMSEC						
	A	B	C	Confidential Confidentiel	Secret	Top Secret Très Secret	NATO Restricted NATO Diffusion Restreinte	NATO Confidential	NATO Secret	COSMIC Top Secret COSMIC Très Secret	Protected Protégé			Confidential Confidentiel	Secret	Top Secret Très Secret	
											A	B	C				
Information / Assets Renseignements / Biens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IT Media Support TI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IT Link Lien électronique	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?

La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No  
Non

☐ Yes  
Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée.

12. b) Will the document attached to this SRCL be PROTECTED and/or CLASSIFIED?

La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No  
Non

☐ Yes  
Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).

Dans l'affirmative, classifiez le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquez qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).



Government of Canada  
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Contract Number / Numéro du contrat

F7048-16-0039

Security Classification / Classification de sécurité

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

Name (print) - Nom (en lettres moulées)

Thomas Lane

Title - Titre

National Project Manager

Signature

*Tom Lane*

Telephone no. - N° de téléphone

(613) 790-6971

Facsimile - Télécopieur

E-mail address - Adresse courriel

thomas.lane@dfo-mpo.gc.ca

Date

2016-06-20

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)

Sébastien Guay

Title - Titre

Security Officer

Signature

*Sébastien Guay*

Telephone no. - N° de téléphone

613-991-3996

Facsimile - Télécopieur

E-mail address - Adresse courriel

sebastien.guay@dfo-mpo.gc.ca

Date

Nov. 30/17

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?

Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?



No

Non



Yes

Oui

16. Procurement Officer / Agent d'approvisionnement

Name (print) - Nom (en lettres moulées)

Title - Titre

Signature

Telephone no. - N° de téléphone

Facsimile - Télécopieur

E-mail address - Adresse courriel

Date

17. Contracting Security Authority / Autorisé contractant en matière de sécurité

Name (print) - Nom (en lettres moulées)

Andree Francis

Title - Titre

Contract Security Officer

Signature

*Andree Francis*

Telephone no. - N° de téléphone

613-957-9365

Facsimile - Télécopieur

E-mail address - Adresse courriel

Date

23/12/2017

Security Classification / Classification de sécurité





Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

Coast Guard

Garde côtière

# ***RADAR Equipment Procurements***



***Canadian Coast Guard***  
***STATEMENT OF WORK***

F7048-160039

EKME Document No. 3468591 v.13

RADAR EQUIPMENT PROCUREMENTS

STATEMENT OF WORK

THIRD EDITION JANUARY 18, 2019

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# 1 DOCUMENT MANAGEMENT

## 1.1 AUTHORITY

1.1.1 This document is issued by the Director General Integrated Technical Services (ITS), Canadian Coast Guard's (CCG's) National Technical Authority (TA) under delegation from the Deputy Minister Fisheries and Oceans, and the Commissioner of the CCG.

## 1.2 RESPONSIBILITY

1.2.1 The Project Manager for the procurement of RADAR Equipment, who resides in ITS Electronic and Informatics (E&I) Engineering Services, is responsible for:

- Creation and promulgation of the document;
- Validity and accuracy of the content;
- Availability of this information;
- Updates as needed;
- Periodical revision; and
- Follow-up of all requests, comments and/or suggestions received to the originator.

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## 2 SCOPE

### 2.1 PURPOSE

2.1.1 The purpose of this Statement of Work (SOW) is to define the work to be performed by the Contractor for the CCG requirement to acquire and deploy coastal RADAR equipment; to replace aging coastal RADAR equipment currently used at twenty-three (23) operational RADAR sites and nine (9) Marine Communications and Traffic Services (MCTS) Centres across Canada and at the CCG College, Sydney, Nova Scotia (NS); to add RADAR equipment to the CCG operational network integration laboratory at Québec City, Québec (QC); and to add equipment at eleven (11) new RADAR sites and one (1) additional MCTS Centre.

2.1.2 A RADAR system is comprised of the following major RADAR equipment components: RADAR Transceivers, RADAR Extractor/Tracker, RADAR Antenna System, RADAR Antenna Tower, and miscellaneous components including cabling, waveguides, active dehydrators, power supplies, remote control equipment, RADAR monitoring equipment, etc. as applicable.

2.1.3 The RADAR equipment to be delivered under this SOW includes RADAR antenna system equipment, solid-state RADAR transceiver equipment and RADAR extractor/tracker equipment along with any other components required to optimize target detection, separation and tracking. Collective reference will hereinafter be referred to as the "RADAR Equipment".

2.1.4 The RADAR Equipment deliverables must be able to be integrated by CCG with the CCG's Vessel Traffic Management Information System (VTMIS) which is called the Information System on Marine Navigation (INNAV) taking into account the current and future projected remote site to MCTS Centre network connectivity capacities as defined in the Extractor Technical Statement of Requirements (TSOR).

2.1.5 This SOW details the requirements for the provision of new coastal RADAR equipment, to be located at various CCG sites across Canada, and the associated tasks to be performed by the Contractor.

2.1.6 This SOW is organized into the following sections:

- a. Document Management (Section 1)
- b. Scope (Section 2)
- c. Applicable Documentation (Section 3)
- d. Deliverables (Section 4)
- e. Optional Items (Section 5)
- f. Appendices

2.1.7 The RADAR Equipment will conform with the Information Technology Security Guidance (ITSG) controls in accordance with the RADAR Equipment ITSG-33 Requirements at the System Acceptance Test taking place at the CCG Test Lab.

2.1.8 As referenced in the RADAR Transceiver and Antenna TSOR, the RADAR Equipment delivered by the Contractor will operate with the existing antenna systems at five (5) CCG installations located in the Central & Arctic (C&A) region.

2.1.9 The assembly of RADAR Equipment and Government Furnished Equipment (GFE) at each site will then be referred to as a “RADAR System”.

## **2.2 GENERAL OPERATIONAL CONCEPT AND INTENDED USE OF EQUIPMENT**

2.2.1 The mandate of the CCG’s Marine Communications and Traffic Services (MCTS) is to ensure the safe movement of marine traffic through Canadian waters. The mission of MCTS is to provide communications and traffic services for the marine community and for the benefit of the public at large to ensure:

- Safety of life at sea in response to international agreements.
- Protection of the environment through traffic management.
- Relay of information for business and national interest.

2.2.2 To support the MCTS mission, the CCG operates a number of coastal RADAR sites. CCG RADAR sites operate on a continuous 24/7 basis 365 days a year. High rates of equipment reliability and system availability are critical for the operation of the RADAR system.

2.2.3 The CCG’s ITS directorate is responsible for the life cycle management of all MCTS operational equipment within the CCG. The E&I branch within ITS is responsible for the acquisition, integration, deployment, installation, maintenance and disposal of the RADAR Equipment throughout its life.

## **2.3 ACQUISITION APPROACH**

2.3.1 The Contractor will be responsible for selecting and delivering the complete set of RADAR Equipment components from the INNAV interface to the Antenna front end for the various remote sites to MCTS Centre RADAR Equipment configurations and combinations taking into account current and future remote site to MCTS Centre network connection capacities to scale and ultimately maximize RADAR image resolution and to achieve target detection, separation and tracking. As described in the Extractor TSOR the network connectivity between the remote sites and the centres varies from 1 Mbps at some sites to 100 Mbps at others.

2.3.2 The Contractor will be responsible for delivering RADAR Equipment to the CCG Regional Workshops, included in section 4.1.2.1, across Canada over an anticipated time period of not more than eight (8) years. Depending on availability of funding throughout the project as well as manufacturing cost efficiencies, equipment delivery dates may be advanced or deferred throughout the life of the procurement at the discretion of the CCG and (Public Works and Government Services Canada) PWGSC.

2.3.3 Schedule details will be finalized after contract award. An equipment delivery schedule is identified in section 4.1.2.1 showing critical and essential delivery dates for equipment delivery to the

CCG Regional Workshops, the CCG Test Lab and the CCG College.

2.3.4 Equipment deployment and installation at the sites will be completed by CCG Technical Services not including the CCG Test Lab.

2.3.5 This SOW details the parameters associated with the purchase, support and all other associated requirements as defined herein.

## **2.4 TERMINOLOGY**

2.4.1 The following terms are used in this SOW and in the associated specifications. Their meaning is defined below:

- a. Commercial Off The Shelf (COTS): RADAR equipment that is currently in production and which can be offered without changing the original design or manufacturing environment.
- b. Field-proven: Interviews conducted with other customers, including a review of failure incident reports, indicate that they are operating the same RADAR equipment models in similar operating environments without any failures or signs of reduced operational life that may be attributed to defective design or manufacturing processes for at least three (3) years, or that it can be demonstrated that early failures in the production life have been addressed and the equipment is now performing satisfactorily without any failure indications leading to reduced life expectancy.
- c. Operator Control Position (OCP): OCPs are GFE INNAV workstations to which the RADAR equipment is interfaced.
- d. Maintenance Control Position (MCP): The workstation console with which technologists monitor and perform maintenance and repair functions on MCTS communication systems and equipment.
- e. Days: Refers to working days of the week, not including Canadian holidays or weekends.

### 3 APPLICABLE DOCUMENTATION

3.1 The Contractor must use the following documents to stipulate the work to be performed.

3.1.1 RADAR Equipment Procurements Statement of Work. EKME Document No. 3468591 (English).

3.1.2 RADAR Transceiver and Antenna TSOR, EKME Document No. 3614054 (English).

3.1.3 RADAR Extractor/Tracker TSOR, EKME Document No. 3614056 (English).

3.1.4 RADAR Equipment ITSG-33 Requirements, EKME Document No. 3649079 (English).

3.1.5 ITSG-33 – Canadian Government IT Security Guidelines. <https://www.cse-cst.gc.ca/en/publication/itsg-33>

3.1.6 Quality Management - 1) Guidelines for Configuration Management, ISO 10007:2017 <http://www.iso.org/standard/70400.html> . 2) Consensus Standard for Configuration Management, ANSI/EIA-649 b. <http://standards.sae.org/eia649b/> 3) Test Equipment Calibration Requirements, ISO 9001:2008 c. 7.6 or ISO 9001:2015 c.7.1.5 <https://www.iso.org/standard/62085.html>.

3.1.7 Canadian Environmental Protection Act and all applicable Regulations, Environment Canada; Health Canada, CEPA 1999. This document is available at: <http://laws-lois.justice.gc.ca/eng/acts/c-15.31/>.

3.1.8 Environmental Management Systems, ISO 14001:2015. [http://www.iso.org/iso/catalogue\\_detail?csnumber=60857](http://www.iso.org/iso/catalogue_detail?csnumber=60857)

3.1.9 Hazardous Products Act and all applicable Regulations, Health Canada, R.S., 1985, c.H-3. <http://laws-lois.justice.gc.ca/eng/acts/H-3/>

3.1.10 Transportation of Dangerous Goods Act and Regulations, Transport Canada, 1992 c34. <https://www.tc.gc.ca/eng/acts-regulations/acts-1992c34.htm>

3.1.11 Nuclear Safety and Control Act and all applicable Regulations, Natural Resources Canada, Canadian Nuclear Safety Commission, 1997 c.9. <http://laws-lois.justice.gc.ca/eng/acts/N-28.3/index.html>

3.1.12 Health Canada's Radiofrequency Exposure Guidelines, Safety Code 6. [http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio\\_guide-lignes\\_direct/index-eng.php](http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct/index-eng.php)

3.1.13 Pest Control Products Act and all applicable Regulations, Health Canada, S.C. 2002. c.28 P-9. <http://laws-lois.justice.gc.ca/eng/acts/P-9.01/>

## 4 DELIVERABLES

A summary of the deliverables are attached in the Deliverables List, [Appendix B](#).

### 4.1 EQUIPMENT DELIVERY

#### 4.1.1 RADAR Equipment Delivery in General

4.1.1.1 The RADAR Equipment provided by the Contractor must be COTS, field-proven RADAR Equipment.

4.1.1.2 The Contractor must have previous experience with the integration of the RADAR Equipment for each different configuration proposed by the Contractor for the CCG sites and the Contractor must have previous experience interfacing these RADAR Equipment configurations with a VTMISS using the Asterix or Inter-VTS Exchange Format (IVEF) protocols, or have equivalent experience with RADAR equipment configurations and integration, and preferably have successfully deployed RADAR equipment that is currently in use by other agencies performing vessel traffic services in equivalent coastal marine operational environments.

4.1.1.3 The Contractor must provide with the bid the name and contact information for each Service Provider or organization where the Contractor has completed the deployment of shore based coastal marine X-Band Solid-State RADAR systems for vessel traffic services.

4.1.1.4 The Contractor must provide with the bid the dates and durations when the Contractor has completed the deployment of shore based coastal marine X-Band Solid-State RADAR systems for each of the Service Providers or organizations performing vessel traffic services.

4.1.1.5 The Contractor must identify with the bid the deployments for Service Providers or organizations where the Contractor has experience successfully completing the interfacing of X-Band Solid-State RADAR systems with a VTMISS to perform vessel traffic services.

4.1.1.6 The bidder must provide the dates and durations for Service Providers or organizations where the Contractor has experience interfacing X-Band Solid-State RADAR systems with a VTMISS to perform vessel traffic services.

#### 4.1.2 RADAR Equipment Delivery Schedule

4.1.2.1 RADAR Equipment Delivery Schedule.

REGION	Equipment Configurations		Delivery Workshop	Date
	MCTS Centre	Remote Site		
ATLANTIC North Sector	Placentia	Arnolds Cove	St. John's	FY 2021-2022
	Placentia	Cuslett	St. John's	FY 2021-2022
	Placentia	Pearce Peak	St. John's	FY 2021-2022

	Port Basques	Aux	Port Basques	Aux	St. John's	FY 2022-2023
	Goose Bay	Labrador	Site A (new)		St. John's	May 2021
	Placentia		Site B (new)		St. John's	October 2020
	Placentia		Site D (new)		St. John's	December 2020
<b>ATLANTIC South Sector</b>	Halifax		Chebucto Head		Dartmouth	FY 2023-2024
	Halifax		Georges Island		Dartmouth	FY 2023-2024
	Halifax		Shannon Hill		Dartmouth	FY 2023-2024
	Halifax		Partridge Island		Dartmouth	FY 2023-2024
	Halifax		Red Head		Dartmouth	FY 2020-2021
	Halifax		Tiverton		Dartmouth	FY 2020-2021
	Sydney		Eddy Point		Dartmouth	FY 2022-2023
	Sydney		Site J (new)		Dartmouth	October 2020
	Sydney		Site K (new)		Dartmouth	April 2021
<b>C&amp;A St. Laurent Sector</b>	Les Escoumins		Les Escoumins		Québec City	FY 2023-2024
	Québec		Île Charron		Québec City	FY 2022-2023
	Québec		Pont Jacques Cartier		Québec City	FY 2023-2024
	Québec		Lévis		Québec City	FY 2022-2023
<b>C&amp;A Great Lakes Sector</b>	Sarnia		Point Edward		Sarnia	FY 2023-2024
<b>WESTERN</b>	Prince Rupert		Mt. Ozzard		Victoria	FY 2024-2025
	Victoria		Berry Point		Victoria	FY 2024-2025
	Victoria		Kap 100		Victoria	FY 2024-2025
	Victoria		Bowen Island		Victoria	FY 2024-2025
	Victoria		Mt. Helmcken		Victoria	FY 2024-2025
	Victoria		Mt. Newton		Victoria	FY 2022-2023
	Victoria		Mt. Parke		Victoria	FY 2022-2023
	Victoria		Site C (new)		Comox	<b>**October 2020</b>
	Prince Rupert		Site E (new)		Victoria	<b>**January 2021</b>
	Prince Rupert		Site F (new)		Victoria	<b>*April 2021</b>
	Prince Rupert		Site G (new)		Victoria	<b>*April 1, 2021</b>
	Victoria		Site H (new)		Victoria	<b>*April 1, 2021</b>
	Victoria		Site I (new)		Victoria	<b>*January 2021</b>



<b>CCG Test Lab</b>	QC	Ville de Québec	Québec City	<b>**30 Days after FAT</b>
<b>CCG College</b>	NS	Sydney	College	<b>*30 Days after FAT</b>
<b>Spares</b>				TBD

\*Critical equipment delivery dates with minimal (less than three (3) months) variability are highlighted in **bold**.

\*\*Essential equipment delivery dates with no variability are highlighted in *red*.

4.1.2.2 It is highly desirable that the equipment delivery dates within the first two and half years following contract award as identified in the RADAR Equipment Delivery Schedule in 4.1.2.1 be met.

### 4.1.3 RADAR Equipment Quantities

4.1.3.1 Quantity of sixty-eight (68) RADAR Transceivers, in a dual redundant configuration, for deployment at the operational sites complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, integration and operation.

4.1.3.2 Quantity of two (2) RADAR Transceivers for each transceiver model for a dual system test setup at the CCG Test Laboratory, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.3 Quantity of two (2) RADAR Transceivers, in a dual redundant configuration, for the training setup at the CCG College, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.4 An estimated quantity of five (5) Spare RADAR Transceivers of each model, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.5 The Contractor must determine sparing requirements and recommend sparing quantities for RADAR Transceivers as per section 4.1.5.

4.1.3.6 The quantity of Extractor components as per the RADAR Equipment configurations defined by the Contractor as required to interface the RADAR Transceiver and RADAR Antenna Systems at each of the remote sites with the corresponding MCTS Centre INNAV workstation, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, integration and operation.

4.1.3.7 Quantity of one (1) set of Extractor components for the test setup at the CCG Test Laboratory, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.8 Quantity of one (1) set of Extractor components for the CCG College training setup, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.9 An estimated quantity of five (5) sets of Extractor component spares, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and

operation.

4.1.3.10 The Contractor must determine sparing requirements and recommend sparing quantities for the set of Extractor components as per section 4.1.5.

4.1.3.11 Quantity thirty-one (31) RADAR Antenna Systems of various sizes as per RADAR Transceiver and Antenna TSOR Section 3.2, complete with all instructions, materials, parts, assemblies, cables and power cords, and applications necessary for its installation, integration and operation. If the Contractor elects to replace all RADAR Antenna Systems, than a quantity thirty-six (36) RADAR Antenna Systems of various, complete with all instructions, materials, parts, assemblies, cables and power cords, and applications necessary for its installation, integration and operation.

4.1.3.12 An estimated quantity of eight (8) Spare RADAR Antenna Systems of various sizes, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

4.1.3.13 The Contractor must determine sparing requirements and recommend sparing quantities for the RADAR Antenna Systems as per section 4.1.5.

4.1.3.14 Quantity of additional computing equipment as necessary for RADAR Maintenance and Information Display for deployment with the RADAR Equipment in the equipment building at each of the remote sites, the equipment rooms at each of the operations centres, the CCG Test Laboratory, the CCG College, along with any related sparing requirements as per section 4.1.5, complete with all instructions, materials, parts and assemblies, and applications necessary for its installation and operation.

#### **4.1.4 RADAR Equipment Independent Software Applications**

4.1.4.1 For any software applications, such as Maintenance and Information Display or Transceiver Control Interface as described in the TSORs, that may be installed separately from the RADAR Equipment provided by the Contractor, the Contractor must provide a copy of the software installation packages.

#### **4.1.5 RADAR Equipment Maintenance, Sparing and Spares**

4.1.5.1 The CCG will maintain and operate the RADAR Equipment for a period of at least twenty (20) years.

4.1.5.2 The CCG will use a combination of on-hand spares and Level Three (factory) repairs or replacements.

4.1.5.3 The Contractor must provide a list of recommended spares in accordance with the Supply Plan, [Appendix F](#) to maintain the RADAR Equipment in accordance with the CCG's maintenance philosophy, which is to repair by replacement down to the Line-Replaceable Unit (LRU).

4.1.5.4 The Contractor must provide a Recommended Spare Parts List (RSPL) identifying spares needed and a schedule to support the system for twenty (20) years.

4.1.5.5 It is intended that the CCG will support the RADAR Systems as follows:

- a. Preventive maintenance will consist primarily of remote performance monitoring of key System parameters with a minimal requirement for on-site time-based maintenance;
- b. Restoration of out-of-tolerance sub-systems to within tolerance conditions will be primarily performed by adjustment and/or replacement of modules, major components or equipment;
- c. All repairs performed by the CCG staff should be accomplished using plug-in/modular assemblies and parts using common tools;
- d. The CCG uses the following Levels of Support:
  - i. Level One support will be provided by CCG ITS personnel, typically at the MCTS MCP;
    - a. Level One support is routine monitoring and maintenance of the RADAR System components or assemblies from the MCTS MCP. Many functions can also be accessed from the local panel of equipment. It may include corrective, preventive, and/or predictive maintenance. It may also involve data gathering, preliminary diagnosis of faults, or actions, such as running a Built-In Self-Test (BIST), or resetting hardware or software. Typically, Level One tasks can be performed relatively quickly, are not service affecting, and do not require specialized tools or test equipment.
  - ii. Level Two support will be provided by CCG ITS personnel, typically at the RADAR site;
    - a. Level Two support is corrective or preventative maintenance by repair or replacement of assemblies or parts to the LRU level. It also includes software and firmware upgrades to the RADARs, and diagnosis of problems. Typically, Level Two tasks can be performed in less than an hour (not including time to respond to site, some exceptions may occur for the replacement of major mechanical assemblies or parts) and may require some specialized training, tools or test equipment.
  - iii. Level Three support will be provided by a RADAR Equipment Supplier, or a designated alternate repair organisation;
    - a. Level Three support is repair of LRUs by a RADAR Equipment Supplier. If an LRU has failed and been replaced at the RADAR site, CCG personnel will ship the LRU to the RADAR Equipment Supplier repair facility or depot. The RADAR Equipment Supplier must then repair the LRU and return it to the CCG.

4.1.5.6 The Contractor must provide system availability and equipment reliability analysis in accordance with [DID SE-09 – Reliability Data](#), taking into consideration the configuration of the RADAR Equipment within the RADAR System deployments, and recommend and draft a maintenance plan, national sparing strategy and spares list, based on projected equipment outages over a twenty (20) year operational life span taking into consideration CCG's National Spares Management Strategy, [Appendix E](#) and RSPL data elements in the Supply Plan [Appendix F](#). For the purpose of completing the reliability and availability analysis, the RADAR System is considered to include the rack, power, dual configured RADAR transceivers, antenna systems (and if applicable including turning units), extractors, related communication controls, and ancillary equipment.

4.1.5.7 The Contractor must present a draft of the system and equipment reliability and availability analysis report, recommended maintenance plan, sparing strategy and sparing list at the Spares Provisioning Meeting (SPM) which is to be scheduled within sixty (60) days after contract award.

4.1.5.8 CCG must review and decide subsequent to the SPM, what spares will be purchased.

4.1.5.9 The Contractor must deliver the spare RADAR Equipment, spare parts, specialized test equipment, tools, and software as agreed, subsequent to the CCG's decision.

4.1.5.10 Section 4.1.3 includes estimated quantities for RADAR Equipment sparing as a placeholder, complete with all, hardware and software specification(s)/version description document(s), packaging, storage instructions, installation instructions, service manuals, materials, parts and assemblies necessary for installation and operation throughout the equipment's expected life as defined in section 4.1.5.1. The actual quantities to be delivered may be determined to be more or less than estimated.

#### **4.1.6 Preservation, Packaging, Packing, Marking**

4.1.6.1 The Contractor must deliver all equipment according to the Supply Plan, [Appendix F](#).

#### **4.1.7 Asset Management System Data**

4.1.7.1 An Asset Management System (AMS) has been implemented in the CCG. The AMS provides users with a tool to plan, execute, track, and analyze activities such as procurement, preventive and corrective maintenance, inventory, and maintenance history, etc. The AMS also provides access to an electronic documentation system including technical manuals, diagrams and schematics, system documentation, and maintenance service agreements.

4.1.7.2 For data entry purposes, the Contractor must supply all required information in accordance with the following:

- a. Data down to the smallest removable sub-assembly level – Lower Line-Replaceable Unit (LLRU);
- b. Data submitted in electronic format (Microsoft Excel®);
- c. Data supplied using the conventions and standards for descriptions of AMS, in accordance with the Supply Plan [Appendix F](#); and
- d. The contents of the data submission, as discussed during the Project Kick-Off Meeting.

4.1.7.3 An electronic copy of Microsoft Excel® template file will be provided to the Contractor during the Project Kick-Off Meeting. The Excel file must be completed and populated by the Contractor and returned to the CCG prior to the initial shipment of the equipment.

## **4.2 INTEGRATION AND INSTALLATION**

### **4.2.1 Integration with Existing Equipment**

4.2.1.1 The RADAR Equipment deliverables must be capable of integration with the RADAR Antenna Systems that are being retained at five (5) sites within the C&A region if the Contractor

chooses not to replace the RADAR Antenna Systems at these C&A sites.

4.2.1.2 The Contractor must supply all installation instructions, service manuals, materials, parts and assemblies necessary for equipment installation and interfacing.

## 4.2.2 INNAV Interface Development Support

4.2.2.1 The Contractor must plan for interface development support throughout the procurement.

4.2.2.2 The interface support for the INNAV interface development must include the following:

- a. Provide equipment configuration documentation down to the smallest removable sub-assembly level – LLRU;
- b. Provide RADAR Equipment interface and communication control specifications to a CCG designated third party INNAV Developer;
- c. Respond to queries by the INNAV Developer;
- d. Prepare a test plan in coordination with the INNAV Developer and perform tests to demonstrate that the RADAR Equipment operates fully with the INNAV control functions prior to installation;
- e. Report issues identified during the test in advance of the INNAV Interface Readiness Review (IIRR);
- f. During the INNAV Interface Test (IIT) and Site Acceptance Tests (SATs) verify RADAR Equipment is operating correctly with the INNAV control commands; and
- g. Prepare test reports identifying any issues raised during the tests.

## 4.2.3 Installation Service Support

4.2.3.1 The Contractor must plan for up to five (5) days for on-site installation support at each of the following locations, 180 days in total. This number of days may be adjusted up or down, as required.

RADAR SITE DATA				
REGION	MCTS CENTRE	SITE NAME	LATITUDE	LONGITUDE
ATLANTIC North Sector	Placentia	Arnolds Cove	47°46'23.0"N	53°59'58.5"W
	Placentia	Cuslett	46°58'28.1"N	54°09'15.3"W
	Placentia	Pearce Peak	47°17'28.3"N	53°58'09.0"W
	Placentia	Site B (new)	*TBF at CA	*TBF at CA
	Placentia	Site D (new)	*TBF at CA	*TBF at CA
	Port Aux Basques	Port aux Basques	47°34'19.0"N	59°07'56.9"W
	Goose Bay Labrador	Site A (new)	*TBF at CA	*TBF at CA
ATLANTIC South Sector	Halifax	Chebucto Head	44°30'27.0"N	63°31'22.3"W
	Halifax	Georges Island	44°38'26.1"N	63°33'31.5"W
	Halifax	Shannon Hill	44°41'02.8"N	63°36'36.0"W
	Halifax	Partridge Island	45°14'21.1"N	66°03'13.8"W
	Halifax	Red Head	45°14'00.7"N	65°59'03.4"W

	Halifax	Tiverton	44°23'23.5"N	66°13'21.3"W
	Sydney	Eddy Point	45°30'47.9"N	61°15'10.8"W
	Sydney	Site J (new)	*TBF at CA	*TBF at CA
	Sydney	Site K (new)	*TBF at CA	*TBF at CA
<b>C&amp;A St. Laurent Sector</b>	Les Escoumins	Les Escoumins	48°19'03.8"N	69°25'13.4"W
	Québec	Île Charron	45°35'03.7"N	73°29'39.5"W
	Québec	Pont Jacques Cartier	45°31'16.2"N	73°32'20.4"W
	Québec	Lévis	46°49'09.5"N	71°10'59.8"W
<b>C&amp;A Great Lakes Sector</b>	Sarnia	Point Edward	43°00'04.1"N	82°25'05.8"W
<b>WESTERN</b>	Prince Rupert	Mt. Ozzard	48°57'34.2"N	125°29'35.0"W
	Prince Rupert	Site E (new)	*TBF at CA	*TBF at CA
	Prince Rupert	Site F (new)	*TBF at CA	*TBF at CA
	Prince Rupert	Site G (new)	*TBF at CA	*TBF at CA
	Victoria	Site H (new)	*TBF at CA	*TBF at CA
	Victoria	Site I (new)	*TBF at CA	*TBF at CA
	Victoria	Berry Point	49°17'42.9"N	122°59'13.3"W
	Victoria	Kap 100	49°19'31.3"N	123°08'01.2"W
	Victoria	Bowen Island	49°20'40.8"N	123°23'17.2"W
	Victoria	Mt. Helmcken	48°24'07.1"N	123°34'22.0"W
	Victoria	Mt. Newton	48°36'47.4"N	123°26'35.8"W
	Victoria	Mt. Parke	48°50'23.1"N	123°17'45.6"W
	Victoria	Site C (new)	*TBF at CA	*TBF at CA
<b>CCG Test Lab</b>	QC	Ville de Québec	46°48'38.4"N	71°12'07.9"W
<b>CCG College</b>	NS	Sydney	46°08'52.2"N	60°13'25.9"W

\*TBF at CA – To be finalized at Contract Award.

4.2.3.2 The project schedule baseline including placeholders for site installations must be reviewed and finalized during the Project Kick-Off Meeting.

## 4.2.4 CCG Test Laboratory Installation

4.2.4.1 It is desired that the RADAR Equipment be delivered and installed within thirty (30) days following FAT.

4.2.4.2 The RADAR Equipment must be delivered and installed by the Contractor in the CCG Test Laboratory.

4.2.4.3 The RADAR Equipment must be connected to the CCG Operational Network (OpNet).

4.2.4.4 The Contractor must use the Internet Protocol (IP) addresses and the machine naming defined by the CCG.

4.2.4.5 The CCG Network Time Protocol (NTP) server must be used.



4.2.4.6 CCG will install Sophos anti-virus on all computers and servers, hence the equipment must be provisioned accordingly so that the anti-virus does not affect performance to the extent that it would no longer be compliant with the TSORs, ITSG-33 requirements and SOW.

## **4.2.5 CCG College Installation**

4.2.5.1 The RADAR Equipment should be delivered to the CCG College within thirty (30) days following FAT.

4.2.5.2 The CCG will complete the installation of the RADAR Equipment at the College.

## **4.2.6 Site Installation, On-Site Inspections, and SATs**

4.2.6.1 The Contractor must provide installation service support for the installation/SAT for each site.

4.2.6.2 An installation schedule must be finalized during the Installation Readiness Reviews (IRRs).

4.2.6.3 The Contractor must develop an Installation Plan for each Site.

4.2.6.4 The Contractor must conduct on-site inspections of the RADAR Equipment installations associated with the sites identified in section 4.2.3 not including the CCG College.

4.2.6.5 The Contractor must verify the physical installation and system configuration.

4.2.6.6 The Contractor must perform preliminary operational testing of all functionalities and key parameters; and

4.2.6.7 The Contractor must complete any preliminary system optimization and equipment calibration.

4.2.6.8 The SATs must be performed immediately following successful completion of the on-site inspections.

4.2.6.9 The Contractor must provide final “as-built” drawings within ten (10) days following successful completion of the SAT.

4.2.6.10 In order to minimize downtime the Contractor must provide installation service support - within three (3) days following the physical installation of the RADAR Equipment.

4.2.6.11 The CCG will complete the physical installation of the RADAR Equipment including items such as but not limited to: waveguide, dehydrator, cabling, and AC power, based on the Contractor-supplied installation drawings and instructions.

4.2.6.12 The RADAR Equipment must be connected to the CCG OpNet network.

4.2.6.13 The Contractor must use the IP addresses and the machine naming defined by the CCG.

4.2.6.14 The CCG NTP server must be used.

4.2.6.15 CCG will install Sophos anti-virus on all computers and servers, hence the equipment must be provisioned accordingly so that the anti-virus does not affect performance to the extent that it

would no longer be compliant with the TSORs, ITSG-33 requirements or SOW.

#### **4.2.7 Site Access**

4.2.7.1 The Contractor must advise the CCG PM of the expected working hours of its personnel and all Subcontractors before commencing on-site work.

4.2.7.2 It is the CCG's responsibility to arrange for the Contractor to have on-site access and to escort the Contractor's personnel at all times.

4.2.7.3 The CCG will provide adequate work space for work benches, tools, and equipment storage. The Contractor is responsible for maintaining these designated areas in a clean and orderly fashion.

#### **4.2.8 Field Support Services**

4.2.8.1 The Contractor must provide Field Support services, as required, for a period that commences after each SAT and ends after the first year of the warranty period, to further optimize and support the installations and operation of RADAR Equipment, either on site and/or remotely.

4.2.8.2 The work to be performed will be defined and approved by the TA and will be at CCG's expense.

4.2.8.3 The Contractor must provide Field Support Service Trip Reports for each call up of Field Support Services within ten (10) days after completed service.

### **4.3 DOCUMENTATION AND DATA**

#### **4.3.1 General**

4.3.1.1 The Contractor must provide all project and technical documentation as specified in this SOW.

4.3.1.2 The Contractor must provide all documentation in a format as outlined in the Data & Documentation Formats, [Appendix C](#).

4.3.1.3 The Contractor must provide the documentation identified in the Contract Data Requirements List (CDRL), [Appendix D](#), in accordance with the corresponding Data Item Descriptions (DID), [Appendix D](#).

4.3.1.4 The Contractor must submit initial documentation as a draft for review, unless specified differently in the sections that follow.

4.3.1.5 The Contractor must submit one (1) soft copy of all draft documents to the CCG location as described at [Appendix C.5](#).

4.3.1.6 Draft and final documentation submission dates, quantities and language requirements are specified in each section and summarized in the CDRL, [Appendix D](#).

4.3.1.7 The CCG will review all draft documentation after receipt from the Contractor and verify its contents, identifying errors and required changes. The CCG will provide the Contractor with a



marked up version of the draft with any errors and required changes identified.

4.3.1.8 The Contractor must correct all errors and changes identified by the CCG, as well as any that it has identified itself in the updated documentation.

4.3.1.9 The Contractor must submit one (1) draft soft copy of all documentation in French after the CCG has accepted the English versions, unless specified differently in each section.

4.3.1.10 The CCG will review the French version and provide a marked up version of the draft with errors/changes identified.

4.3.1.11 The Contractor must supply one (1) final soft copy of all documentation in both English and French.

4.3.1.12 The Contractor must follow approved configuration control processes as per the Contractor's configuration management program for any changes made to the hardware, firmware, software or supplied items that take place after final documentation has been accepted by CCG.

### **4.3.2 Project Management Plan**

4.3.2.1 The Contractor must provide with the bid and maintain throughout the contract a Project Management Plan (PMP) in accordance with Project Management Institute's Project Management Body of Knowledge (PMBOK®) Guide or equivalent practices and include the information contained in [DID PM-01 – Project Management Plan](#) and submit it to the CCG PM for acceptance, including a Work Breakdown Structure (WBS) and a Master Project Schedule (MPS) showing dependencies and the major milestones starting from contract award and ending with the completion of the project.

4.3.2.2 The Contractor must provide with the bid a Risk Management Plan in accordance with [DID PM-03 – Risk Management Plan](#).

4.3.2.3 The Risk Management Plan may be a subset of the PMP.

4.3.2.4 The Contractor must implement a Risk Register (as described in the Risk Management Plan) to track the status of project risks.

4.3.2.5 Within ten (10) days after the Project Kick-Off Meeting, the Contractor must update the draft PMP and Risk Management Plan submitted with the bid, showing the critical path, and high risk items. Once approved by the CCG PM and Contract Authority (CA) this will become the baseline for the remainder of the procurement.

4.3.2.6 The Contractor must manage the project in accordance with the baseline PMP.

4.3.2.7 All changes must be recorded relative to this starting baseline.

4.3.2.8 All changes to key project elements, such as scope and schedule, must be controlled using a disciplined change management process.

4.3.2.9 A Configuration Management Plan (CMP) in accordance with [DID CM-01 – Configuration Management Plan](#) must be included as a separate section in the Contractor's PMP regardless of the origin of the change.

4.3.2.10 The Contractor must ensure that a Change Request is submitted and tracked to completion

in accordance with [DID CM-04](#) – *Change Request*.

4.3.2.11 The configuration management of the RADAR Equipment, see section 4.5.9, must take effect following successful completion and sign-off of the FAT and continue through-out the manufacturer's product support life cycle.

4.3.2.12 In the event that there is substantive concern with the wording of any contractual/project document, the Contractor must submit a request for clarification in accordance with [DID CM-03](#) – *Request for Clarification*.

### 4.3.3 Project Progress Reports

4.3.3.1 The Contractor must provide the CCG PM with written Project Progress Reports (PPRs) in accordance with [DID PM-02](#) – *Contractor Progress and Status Report* for each of the project progress meetings.

4.3.3.2 The project progress meetings must take place monthly.

4.3.3.3 The progress meeting schedule may be amended by mutual agreement of the Contractor and CCG.

4.3.3.4 The PPRs must include target start and completion dates and the percentage completion for each deliverable identified in the Deliverables List, [Appendix B](#).

4.3.3.5 Delays and forecasted problems must be justified and fully explained, with solutions to minimize these delays.

4.3.3.6 The PPRs must also include as a minimum: updated schedules, progress status, actions, deliverables, deficiencies, issues, risks, risk mitigation strategies, upcoming steps, dependencies and concerns.

4.3.3.7 The format of the PPR must be approved by the CCG at the Kick-Off meeting.

### 4.3.4 Technical Publications

4.3.4.1 The Contractor must provide with the bid the supplier COTS technical publications required for description, operation, software user instructions, communication control interface development and commands usage, installation, troubleshooting, maintenance and repair of the RADAR Equipment including sub-systems.

4.3.4.2 Technical Publications may include, but are not limited to the supplier COTS installation drawings and instructions, system manuals, equipment manuals, software user manuals and interface specifications.

4.3.4.3 The Contractor must provide one (1) soft copy in English of the manufacturer's RADAR Equipment interface specifications and guidelines in accordance with [DID SE-11](#) – *Interface Specification* and the RADAR Equipment communications control commands and user guide for the purpose of interfacing the RADAR Equipment with INNAV.

4.3.4.4 Repair schemes must be based on the CCG maintenance philosophy, which is to repair by line unit replacement.

### 4.3.5 Maintenance Plan

4.3.5.1 The Contractor must provide drafts of the Maintenance Plan in accordance with [DID MM-04 – Maintenance Plan](#), [DID MM-05 – Preventive Maintenance Program](#) and [DID MM-06 – Calibration Requirements Report](#), one (1) soft copy in English and French five (5) days prior to the SPM.

4.3.5.2 The Contractor must supply a Maintenance Plan that identifies all necessary corrective and preventive maintenance tasks based on the Contractor's RADAR Equipment maintenance and repair procedures, and the RADAR Equipment Mean Time Between Failures (MTBF) calculations and reliability records, as per the Technical Specifications.

4.3.5.3 The Maintenance Plan must be of sufficient detail to ensure that CCG-trained Technologists are able to troubleshoot, diagnose and replace any defective RADAR Equipment, to the LRU level, and restore the RADAR Equipment to its performance baseline condition detailed in the Specifications.

4.3.5.4 The Maintenance Plan must identify the technical publications, spares, tools and special test equipment needed to perform the appropriate maintenance tasks in alignment with the Supply Plan, [Appendix F](#).

4.3.5.5 The Maintenance Plan must include a section on sparing including equipment reliability and system availability analysis as specified in the TSORs in alignment with [DID SE-09 – Reliability Data](#), CCG's National Spares Management Strategy, [Appendix E](#), and Supply Plan, [Appendix F](#).

### 4.3.6 Equipment Manual

4.3.6.1 The Contractor must provide an Equipment Manual in accordance with [DID TDM-06 – Equipment Manuals](#).

4.3.6.2 This manual is to be used for preventive and corrective maintenance, firmware and software updates and version control, quality assurance audits and commissioning of new RADAR Equipment installations and is intended to be a concise guide for maintenance of RADAR Equipment by a skilled technologist.

### 4.3.7 System Manual

4.3.7.1 The Contractor must provide a System Manual in accordance with [DID TDM-05 – System Manuals](#).

4.3.7.2 This manual is to be used by CCG Operations and is intended to provide a basic description of the functions of each sub-system, and identify and describe the controls that are used to control the operation of the RADAR Equipment.

### 4.3.8 Software Documentation

4.3.8.1 The Contractor must provide documentation in accordance with [DID TDM-08 – Software User Manual](#) on the operational software and firmware used in the system including instructions for upgrading or installing patches.

4.3.8.2 The Contractor must provide documentation of software version controls in accordance with [DID TDM-07](#) – *Software Version Description Document*.

4.3.8.3 This documentation may be incorporated into the System and Equipment Manuals, as appropriate.

### 4.3.9 Training Plan

4.3.9.1 The Contractor must provide a Training Plan which includes both the operational and technical training courses.

4.3.9.2 The Contractor must use the INNAV display as the OCP interface to the RADAR Equipment when developing the operational training portion of the Training Plan.

4.3.9.3 The Contractor must use the RADAR Maintenance and Information Display workstation for the operational and maintenance functions when developing the technical training portion of the Training Plan.

4.3.9.4 The Contractor must provide a draft Training Plan no later than twenty (20) days after the Project Kick-Off Meeting.

4.3.9.5 The Contractor must provide to the CCG the Training Plan draft, including outlines of the training courseware and instructor package in accordance with [DID TT-03](#) – *Training Manuals* and the list of equipment required for training in accordance with [DID TT-02](#) – *Training Devices Requirements List*.

4.3.9.6 The Training Plan must define and outline the course objectives, lesson plans, course syllabus, training aids, instructor manual, student manual, evaluation guide, schedule of proposed courses and the training equipment required.

4.3.9.7 Following approval by the CCG of the Training Plan, the Contractor must also:

- a. Develop the final training courseware and instructor packages;
- b. Supply Training Packages for each of the Operational and Technical training courses;
- c. Provide draft Technical and Operational Training Packages (in English and French) within forty (40) days of the Training Plan approval.
- d. Provide one (1) hard copy of each of the CCG approved Training Packages to each student at the beginning of each course. The Contractor must provide English and French training packages in accordance with the Deliverables List, [Appendix B](#), and supply one (1) spare, for each of the Operational and Technical training courses.

### 4.3.10 Training Course Material

4.3.10.1 The Technical and Operational Training documentation must conform to [DID TT-03](#) – *Training Manuals*.

4.3.10.2 The Technical and Operational Training Packages must be approved by CCG prior to the start of the first training course.

4.3.10.3 The Contractor must include/address the following objectives in the Technical Training Package:

- a. Basic use of the RADAR System
- b. General RADAR Theory
- c. Frequency Diversity Theory
- d. Operational use of RADAR for different weather conditions
- e. Description of purpose of software and services related to RADAR functionalities and/or part of the RADAR System design, which functionalities of the RADAR System are provided by which software/services
- f. Description and demonstration with exercise (hands-on) upon stop and start/restart of essential services (Main & Backup, heartbeat and such)
- g. Description and demonstration with exercise (hands-on) of procedure to gracefully shutdown a RADAR server and restart it
- h. Procedures to upload/upgrade firmware/software in RADAR Equipment
- i. Description and demonstration with exercise (hands-on) of the procedure to rebuild any workstation or server provided with the RADAR System
- j. Installation of the RADAR Equipment
- k. Calibration and performance optimization of the RADAR System
- l. Maintenance of the RADAR Equipment to the manufacturer's specifications
- m. Troubleshoot and diagnose problems with the RADAR Equipment:
  - i. Diagnose equipment problems to the LRU
  - ii. Remove and replace LRU with relevant spares
- n. Remote provisioning, monitoring, health and security status checks and reports, diagnostics, version updates, resets, etc.
- o. RADAR Equipment integration in CCG OpNet IP addresses and naming convention
- p. Support roles and responsibilities, warranty process, in service-support plan, LRU list, Return Material Authorization (RMA) procedure, support related information
- q. Components remote monitoring functionalities and interface (Simple Network Management Protocol (SNMP), etc)
- r. Monitoring of backup processes and restores

4.3.10.4 The Contractor must include/address the following objectives in the Operational Training Package:

- a. Basic use of the RADAR System
- b. General RADAR Theory
- c. Frequency Diversity Theory
- d. Operational use of RADAR for different weather conditions

### 4.3.11 Test Plans and Procedures

4.3.11.1 The Contractor must develop Test Plans in accordance with [DID TE-02 – Test Plan and Reports](#), which details the methodology for the equipment level FATs and equipment and system level INNAV interface verification testing and SATs.

4.3.11.2 The Test Plan for the system level INNAV interface verification testing and SAT must include the use of the INNAV display as the operational interface to the RADAR Equipment.

4.3.11.3 The Contractor must develop Test Procedures for the FAT and SATs in accordance with [DID TE-03](#) – *Acceptance Test Procedures*.

4.3.11.4 The Test Procedures must be designed to demonstrate that the RADAR Equipment meets or exceeds all requirements of the TSORs, ITSG-33 and this SOW.

4.3.11.5 The FAT Configuration Document, see section 4.5.9, and the FAT Test Plan and Procedures must be provided to the CCG for review as part of the FAT Readiness Review (FRR).

4.3.11.6 The SAT Test Plan and Procedures must be provided to the CCG for review as part of the Installation Readiness Review (IRR).

4.3.11.7 The test schedules must form part of the MPS.

### **4.3.12 Installation Drawings and Instructions**

4.3.12.1 The Contractor must provide Installation Drawings and Instructions for the configuration, integration and interface of the complete RADAR System at thirty-four (34) RADAR sites, the CCG Test Lab and the CCG College identified in section 4.2.3.

4.3.12.2 As a part of the installation instructions the Contractor must provide a System Optimization Plan for each operation site.

4.3.12.3 The Contractor must provide to the CCG two (2) printed copies and one (1) electronic copy of the preliminary Installation Drawings and Instructions as part of each IRR package.

4.3.12.4 The Installation Drawings and Instructions for Les Escoumins, Île Charron, Pont Jacques Cartier, and Lévis, and the CCG Test Lab must be in French.

4.3.12.5 In addition to being in accordance with DIDs [TDM-02](#) – *Drawings and Associated Lists* and [TDM-03](#) – *Equipment Installation Data Package*, the Installation Drawings and Instructions must include the following:

- a. Overall work plan and method of procedure;
- b. Identification of all equipment and materials required;
- c. Installation tasks and schedule;
- d. Identification of special requirements needed from the CCG;
- e. The agreed responsibility assignment matrix relating to use of CCG personnel; and
- f. Equipment transport and travel logistics to all sites.

4.3.12.6 Prior to the IRRs the Contractor must provide drafts of the Installation Drawings and Instructions as required to the CCG five (5) working days prior the IRR

4.3.12.7 Following the IRRs the Contractor must update the Installation Drawings and Instructions as required, including the appropriate drawings, and submit the Installation Ready Drawings and Instructions to the CCG fifteen (15) working days following the IRR.

4.3.12.8 Following successful completion of the SATs the Contractor must provide final as-built equipment configuration drawings, including updating the Installation Drawings and Instructions for



site specific deviations, to the CCG, ten (10) working days following the approved SAT.

### **4.3.13 ITSG-33 Security Compliance**

4.3.13.1 CCG networks and information systems incorporating the RADAR Equipment provided by the Contractor must be compliant with ITSG-33 at the Critical Design Review. The RADAR System has been assessed to have a Confidentiality, Integrity and Availability (CIA) rating of 'Protected A, Low, Low'.

4.3.13.2 Where capabilities do not currently exist within the proposed RADAR Equipment and system configuration, the Contractor must provide a development plan and complete the work as part of the overall project delivery to incorporate the missing capabilities.

4.3.13.3 The Contractor must complete and submit with the bid the RADAR Equipment ITSG-33 Requirements Document.

4.3.13.4 The CCG will review and inform the Contractor of any non-compliances at the Project Kick-Off meeting.

4.3.13.5 The Contractor must present resolutions to any non-compliances at the Preliminary Design Review (PDR) meeting.

4.3.13.6 The Contractor must provide a report describing the compliances and non-compliances along with a mitigation plan for addressing any non-compliances at the Critical Design Review (CDR) meeting.

4.3.13.7 The Contractor must incorporate related ITSG-33 Requirements in the System Acceptance Test to be performed at the CCG Test Lab and the CCG will observe completion of System Acceptance Test related to ITSG-33 compliance performed at CCG Test Lab.

## **4.4 PROJECT MANAGEMENT**

### **4.4.1 General**

4.4.1.1 The Contractor must utilize a formal organization of project management disciplines, including methods and procedures for directing, coordinating and controlling all contract efforts necessary to produce, test, deliver and support training and installation of the RADAR Equipment, and to provide all other work, material, services and data as detailed in this SOW.

4.4.1.2 The project management methodology must be based on a recognized industry standard such as PMBOK®, Projects in a Controlled Environment (PRINCE2®) or similar internationally recognized standard for managing project delivery.

4.4.1.3 The Contractor must establish this internal organization, headed by a single project manager, to carry out the work required for the project.

4.4.1.4 The project manager must have sufficient authority to plan, direct, control and make decisions for the project and to ensure that all contracted requirements are met in terms of tasks, specifications, schedules, quality and budget.

4.4.1.5 The project manager must be the main point of contact with the CCG.

#### 4.4.2 Subcontract Management

4.4.2.1 The same controls and requirements placed on the Contractor's project team must also be applicable to all Subcontractors.

4.4.2.2 If any of the work is subcontracted to another company or another division of the Contractor's organization, all requirements of this SOW must remain in force for the subcontracted work.

4.4.2.3 The Contractor must monitor and report on each subcontract to ensure that the subcontracted work progresses as required.

#### 4.4.3 Problem Reporting/Design Changes

4.4.3.1 The Contractor must advise the CCG by phone and email immediately on identifying a problem or issue that may result in a non-conformance to the Contract.

4.4.3.2 Upon such notification, the CCG will advise whether an unscheduled meeting or other action is required.

4.4.3.3 The Contractor must record all issues/problems and their resolution/disposition in an Issues Log, regardless of their severity, for review by the CCG.

4.4.3.4 New and changes to issues/problems must be referenced in the monthly progress report.

4.4.3.5 The Contractor must report to the CCG PM and document any project changes, requirements changes, or design changes that may occur during the contract in accordance with [DID CM-04](#) – *Change Request*.

#### 4.4.4 Security

4.4.4.1 The Contractor's staff conducting the work must adhere to the provisions of the Contract Security Requirements Check List (SRCL).

4.4.4.2 The Contractor's staff, when on a CCG site, must be escorted by CCG personnel at all times.

#### 4.4.5 Project Meetings

4.4.5.1 The following meetings and reviews must be coordinated by the Contractor:

- a. Project Kick-Off (at Contractor's facility, Chair CA and PM);
- b. Project Progress Review Meetings (PRM) (teleconference, Chair CA and PM );
- c. Project Preliminary Design Review (PDR) (location determined at Kick-Off, Chair CA and TA);
- d. Project Critical Design Review (CDR) (location determined at Kick-Off, Chair CA and TA);
- e. INNAV Interface Readiness Review (IIRR) (Quebec Lab, Chair TA and PM);
- f. Spares Provisioning Meeting (SPM) (location determined at Kick-Off, Chair TA and PM);



- g. In-Service Support Review Meeting (ISSR) (at CCG HQ, Chair CA and PM);
- h. Factory Acceptance Test Readiness Review (FRR) (location determined at Kick-Off, Chair TA and PM);
- i. Factory Acceptance Testing (FAT) (at Contractor's Manufacturing Facility, Chair TA and PM);
- j. Post Factory Acceptance Test Review (PFR) (locations to be determined, (Chair TA and PM);
- k. Training Readiness Review (TRR) (location determined at Kick-Off, Chair PM and TA);
- l. Installation Readiness Reviews (IRR) (locations to be determined, Chair PM and TA);
- m. Site Installation (At CCG Sites remote and centre, Chair TA and regional PM/TA);
- n. Site Acceptance Testing (SAT) (at CCG Sites remote and centre, Chair TA and regional PM/TA); and
- o. Final Project Review (at CCG HQ, Chair CA and PM).

4.4.5.2 Where practical, reviews and meetings should be scheduled to be held in conjunction with a regular PRM.

4.4.5.3 At CCG's discretion some or all meetings will be conducted via teleconferences. Meetings conducted by teleconference may utilize video and web hosting capabilities, if required to support the intent of the meeting.

#### **4.4.6 Conduct of Meetings**

4.4.6.1 The Chair for each review meeting must be as described in section 4.4.5.1 unless otherwise agreed to by the Contractor, PWGSC and the CCG.

4.4.6.2 Meetings generally must be hosted by way of teleconference calls unless specifically stated otherwise.

4.4.6.3 The Contractor must be responsible for the following in preparing for, and conduct of, these reviews and meetings:

- a. Host and convene the reviews and meetings unless otherwise agreed by PWGSC and the CCG;
- b. Co-ordinate, with PWGSC and the CCG, the agenda.
- c. Ensure appropriate participation by Subcontractors, suppliers, and subject matter experts;
- d. Organize and present briefings as necessary;
- e. Provide appropriate facilities and administrative services;
- f. Provide test data, design data, and analysis supporting the review;
- g. Record, publish, and distribute minutes with Action Items and due dates documented in the reviews and meetings; and
- h. Maintain files of records, an Action Item database, and documentation from all reviews and meetings.

4.4.6.4 One (1) electronic copy of the agenda, for approval, and the related documents for these meetings must be provided to PWGSC CA and the CCG PM, five (5) working days prior to the

meeting.

4.4.6.5 The Contractor must maintain historical, chronological, and an up-to-date list of Action Items in accordance with [DID PM-02](#) – *Contractor Progress and Status Report*.

4.4.6.6 Outstanding Action Items must be an attachment to all meeting agendas, as tracked in the Progress and Status Report.

4.4.6.7 Minutes must be distributed within five (5) days of the corresponding meeting.

4.4.6.8 The CCG must have final approval over the content of the minutes.

4.4.6.9 The reviews and meetings may be cancelled at the discretion of the CCG with a minimum of ten (10) days' notice.

4.4.6.10 Rescheduling of reviews and meetings by the Contractor must be done only with the approval of the PWGSC CA and the CCG PM.

#### **4.4.7 Project Kick-Off Meeting**

4.4.7.1 A Project Kick-Off Meeting must take place between the Contractor, PWGSC and the CCG within twenty (20) days after contract award at the mutual agreement of the Contractor, PWGSC and the CCG, to:

- a. Introduce the CCG, PWGSC and Contractor management teams;
- b. Review the PMP, including work processes, the project schedule, milestones, and deliverables;
- c. Discuss project risks and any other issues that may affect the project or equipment performance or delivery;
- d. Clarify any outstanding questions related to the requirements, contract and Contractor's proposal;
- e. Discuss any other business; and
- f. Tour Contractor and Subcontractor facilities.

#### **4.4.8 Project Progress Review Meetings**

4.4.8.1 The Contractor must conduct monthly Project Progress Review Meetings (PRMs) with the CCG Project Team members and/or appointed representatives in attendance.

4.4.8.2 At the CCG's discretion the monthly meetings may be cancelled during periods of inactivity.

#### **4.4.9 Project Preliminary Design Review Meeting**

4.4.9.1 The Contractor must conduct a Project Preliminary Design Review (PDR) meeting with the CCG Project Team members and/or appointed representatives in attendance.

4.4.9.2 The PDR may be combined with the Kick-Off meeting for efficiency, as mutually agreed to by the CCG, PWGSC and the Contractor.

4.4.9.3 The Contractor must develop a preliminary system concept covering all hardware and software units in the system.

4.4.9.4 The design approach to all problems and a complete technical solution in schematic form must be presented.

4.4.9.5 The concept must be documented as stated below:

- a. System block diagram;
- b. Detailed description of system concept;
- c. Preliminary screen shots for the Contractor supplied Human Machine Interface (HMI); and
- d. Temporary status/control menus.

4.4.9.6 The Contractor must deliver the software documentation to the CCG five (5) days prior to PDR.

4.4.9.7 The preliminary design information must be documented in accordance with [DID SE-10](#) – *Technical Review Preparation* and reviewed at the PDR.

4.4.9.8 The design and the methodology used by the Contractor must be reviewed in detail.

4.4.9.9 On receipt of approval at the PDR the Contractor must complete the detailed design of all hardware and software prior to presentation at the CDR.

4.4.9.10 The Contractor must provide any ITSG-33 non-compliance resolutions in English for review and approval at the PDR.

#### **4.4.10 Project Critical Design Review Meeting**

4.4.10.1 The Contractor must conduct a Critical Design Review (CDR) within thirty (30) working days after PDR.

4.4.10.2 If the Contractor can provide references that they have experience deploying the site specific equipment and configurations proposed in the bid and that these deployed equipment configurations are currently operating in Coastal Marine VTMISS the CDR may be combined with the PDR to optimize the upfront delivery schedule at the CCG's discretion, as mutually agreed to by CCG, PWGSC and the Contractor.

4.4.10.3 The Contractor must prepare documentation for the CDR in accordance with [DID SE-10](#) – *Technical Review Preparation* and deliver the detailed system design to the CCG five (5) days prior to the CDR.

4.4.10.4 The documentation must include, but not be limited to the following:

- a. Detailed system and equipment block diagrams;
- b. Production drawings and schematics;
- c. LRU Parts lists for all equipment;
- d. Information of equipment specifications (such as but not limited to, performance parameters, etc.);

- e. Final HMI designs;
- f. Completed report identifying ITSG-33 compliances and mitigation plans for non-compliances;
- g. Verification and Validation (V&V) Test Report;
- h. Final status/control menu designs;
- i. Final Technical Data Management Documents as described in [Appendix D](#);
- j. FAT Configuration Documentation as described in section 4.5.9; and
- k. Final Engineering Documents as described in [Appendix D](#).

4.4.10.5 The Contractor must provide updated responses to the RADAR Equipment ITSG-33 Requirements template with any changes to the RADAR System Configuration identified in the PDR prior to presentation at the CDR.

#### **4.4.11 INNAV Interface Readiness Review**

4.4.11.1 The Contractor must conduct an INNAV Interface Readiness Review (IIRR) and complete INNAV interface testing at the CCG Test Lab to review and demonstrate seamless operation of the RADAR Equipment with the INNAV.

4.4.11.2 The IIRR must be a collaborative effort between the INNAV team, the Contractor, and the INNAV developer to review and demonstrate that the INNAV control software is ready for site installation with the RADAR Equipment.

4.4.11.3 The INNAV developer will provide CCG and the Contractor with the relevant technical data and documentation related to the INNAV interface development and proof of performance to support preparation for the IIRR.

4.4.11.4 Five (5) days prior to the review, the Contractor must provide one (1) electronic copy of all relevant technical data and documentation for the review in accordance with [DID SE-10 – Technical Review Preparation](#) to prepare for the IIRR.

4.4.11.5 In coordination with the CCG and the INNAV Developer, the Contractor must supply to the CCG all technical data and configuration documentation for the Test Lab in Québec City in French and English related to the INNAV interface development testing and test results, RADAR Equipment installation, system testing, operation and optimization of the overall RADAR Equipment system configuration.

#### **4.4.12 Spares Provisioning Meeting**

4.4.12.1 The Contractor must conduct a Spares Provisioning Meeting (SPM).

4.4.12.2 The SPM must be a collaborative effort between the CCG and the Contractor to review the reliability and availability analysis, sparing strategy, maintenance plan and recommended spares.

4.4.12.3 The SPM must be conducted in conjunction with the In-Service Support Review (ISSR) to address interdependencies between sparing, maintenance and In-Service Support planning.

4.4.12.4 The SPM may be combined with the CDR meeting for efficiency, as mutually agreed to by the CCG, PWGSC and the Contractor.

4.4.12.5 Five (5) days prior to this review, the Contractor must supply to the CCG one (1) electronic copy of all relevant materials, SPM Package - reliability and availability analysis, sparing strategy, maintenance plan and recommended spares in accordance with the TSORs, [DID SE-09 – Reliability Data](#), CCG's National Spares Management Strategy, [Appendix E](#) and RSPL data elements as in the Supply Plan, [Appendix F](#).

#### **4.4.13 FAT Readiness Review**

4.4.13.1 At the CCG's discretion, the Contractor must conduct a FAT Readiness Review (FRR) meeting.

4.4.13.2 The FRR may be combined with the CDR meeting for efficiency, as mutually agreed to by the CCG and the Contractor.

4.4.13.3 Five (5) days prior to this review, the Contractor must supply to the CCG one (1) electronic copy of all relevant materials (FAT Test Plans and Procedures drafts) in accordance with [DID TE-02 – Test Plan and Report](#) and [DID TE-03 – Acceptance Test Procedures](#) in French for the Les Escoumins, Île Charron, Pont Jacques Cartier, and Lévis, and in French and English for the Test Lab in Québec City, and in English for the remainder of the sites.

#### **4.4.14 Post FAT Review**

4.4.14.1 Following the FAT, at the CCG's discretion, the Contractor must conduct a Post FAT Review (PFR) meeting.

4.4.14.2 This meeting must ensure that any issues identified during the FAT are clearly defined and that any remedial activities required are clearly defined and agreed to by the CCG.

4.4.14.3 This may include a complete repeat of the FAT, a repeat of specific tests within the FAT, or certification by other means to demonstrate that the RADAR Equipment is compliant with all requirements of the FAT.

#### **4.4.15 Training Readiness Review**

4.4.15.1 A Training Readiness Review (TRR) must be conducted to ensure that all plans, materials, and resources are ready for the training.

4.4.15.2 The TRR must be a collaborative effort between the CCG and the Contractor to review the training plans and responsibilities of each party and to identify any outstanding items or issues before resources are deployed to the CCG College to begin training.

4.4.15.3 The timing of the TRR must be mutually agreed between the CCG and the Contractor.

4.4.15.4 At CCG's discretion, separate TTRs must take place for operational and technical training.

4.4.15.5 Five (5) days prior to this review, the Contractor must supply to the CCG one (1) electronic copy of all relevant training materials and devices (TRR Package) in accordance with [DID TT-03 – Training Manuals](#) and [DID TT-02 – Training Devices Requirements List](#) for TRR preparation

purposes.

#### **4.4.16 Installation Readiness Reviews**

4.4.16.1 The Contractor must conduct an Installation Readiness Review (IRR) for each of the thirty-four (34) RADAR sites, the CCG Test Lab and the College to ensure that all plans, materials, and resources are ready for the installation.

4.4.16.2 The IRRs must be a collaborative effort between the CCG and the Contractor to review the installation plans and responsibilities of each party and to identify any outstanding items or issues before resources are deployed to each site to begin installation.

4.4.16.3 The timing of the IRRs must be mutually agreed between the CCG and the Contractor.

4.4.16.4 Five (5) days prior to each review, the Contractor must supply to the CCG all relevant technical data and documentation (IRR Packages) for IRR preparation purposes including Installation Drawings and Instructions in accordance with DIDs [TDM-02 – Drawings and Associated Lists](#) and [TDM-03 – Equipment Installation Data Package](#) and SAT Test Plans and Procedures drafts in accordance with [DID TE-02 – Test Plan and Report](#), and [DID TE-03 – Acceptance Test Procedures](#) in French for Les Escoumins, Île Charron, Pont Jacques Cartier, and Lévis, in French and English for Test Lab in Québec City, and in English for the remainder of the sites.

#### **4.4.17 In-Service Support Review Meeting**

4.4.17.1 The Contractor must conduct an In-Service Support Review (ISSR) in the first year of the contract.

4.4.17.2 The ISSR must be a collaborative effort between PWGSC, the CCG and the Contractor to review the In-Service Support Plan.

4.4.17.3 The ISSR must be conducted in conjunction with the SPM to address interdependencies between sparing, maintenance and In-Service Support planning.

4.4.17.4 Five (5) days prior to this review, the Contractor must supply to the CCG one (1) electronic copy of the tailored In-Service Support Plan in accordance with section 4.8.2.

#### **4.4.18 Final Project Review Meeting**

4.4.18.1 The Contractor must conduct a Final Project Review meeting at a time to be agreed to by the CCG, PWGSC and the Contractor.

4.4.18.2 The Final Project Review meeting must address all remaining issues.

4.4.18.3 The Final Project Review must confirm that the following are complete:

- a. All installations are complete;
- b. The SATs are complete and all tests results are accepted;
- c. The SAT Reports are correct and complete and delivered;
- d. All documentation and deliverables have been delivered and accepted;

- e. All outstanding project issues have been dealt with; and
- f. All milestones are met including all scope changes.

#### **4.4.19 Additional – Extraordinary Meetings**

4.4.19.1 At the CCG's discretion, the Contractor must conduct additional PRMs to resolve specific issues.

4.4.19.2 The Contractor must provide suitable representation at extraordinary meetings (teleconference or in person), as agreed.

4.4.19.3 Extraordinary meetings may be scheduled by the CCG in the event of delays in achieving the work schedule, or if major problems of a technical or contractual significance occur that cannot wait for the next scheduled PRM.

### **4.5 TESTING AND ACCEPTANCE**

#### **4.5.1 Testing General**

4.5.1.1 The FATs, IIT and SATs are formal tests which demonstrate to the CCG that the Contractor's RADAR Equipment and configurations are compliant with all requirements included in the TSORs, ITSG-33 requirements, and SOW.

4.5.1.2 The CCG reserves the right to waive the requirement for any test called up by Contractor's Test Plan or to call up additional tests to demonstrate that the RADAR Equipment is compliant with the requirements.

4.5.1.3 The CCG or its representative, at its discretion, reserves the right to witness any or all tests.

#### **4.5.2 Test Failures**

4.5.2.1 The Contractor must be responsible for the resolution of all failures reported during all test phases, which include, but are not limited to, equipment repair or re-design necessary to correct the failures and perform partial or complete system re-tests subject to the CCG TA's discretion and approval.

#### **4.5.3 Test Diagnostic Routines**

4.5.3.1 Any local and remote test diagnostic routines developed by the manufacture for production testing useful for trouble-shooting hardware and software problems must be documented and a description of their use provided to the CCG prior to the IIRR.

#### **4.5.4 Unit Production Tests**

4.5.4.1 The Contractor must conduct Unit Production Tests on each piece of equipment being delivered as it leaves the production line and prior to integration in the CCG environment, in accordance with the Contractor's documented Testing Procedures.

4.5.4.2 A copy of such test results must be included as part of the shipping documents to CCG.



## 4.5.5 RADAR Equipment Verification and Validation Tests

4.5.5.1 The Contractor must perform Verification and Validation (V&V) tests to verify that each different RADAR Equipment configuration and the various sub-systems meet all technical and operational design parameters and requirements, including the control software and Graphical User Interface.

4.5.5.2 V&V tests must be conducted in accordance with the Contractor's equipment integration performance test plans.

4.5.5.3 Upon successful completion of the V&V tests, the Contractor must provide to the CCG one (1) electronic and one (1) printed copy of the Verification Test Report including the completed test sheets, signed by the Contractor's V&V authority.

## 4.5.6 Factory Acceptance Test

4.5.6.1 The Contractor must prove, through test and evaluation, that all RADAR Equipment configurations meet the requirements defined in the TSORs, as follows:

- a. The Contractor must provide a draft FAT Plan ([DID TE-02](#) – *Test Plan and Report*) and Procedures ([DID TE-03](#) – *Acceptance Test Procedures*) including the FAT Configuration Document, prior to the FRR.
- b. The FAT Plan and Procedures must be reviewed at the FRR
- c. The FAT Plan and Procedures must be approved by the CCG TA before any FAT is performed.
- d. FATs must be witnessed by CCG representatives.
- e. Printed copies of the Test Procedures must be supplied to the CCG witnesses during tests.
- f. Ten (10) working days after the completion of the FAT, the Contractor must submit to the CCG an electronic copy of the FAT report for final approval and acceptance.
- g. The FAT must be conducted at the Contractor's manufacturing facility with calibrated test equipment with valid calibration dates.
- h. The Contractor must have all of its test equipment calibrated in accordance with ISO 9001:2015 or equivalent.
- i. CCG will be entitled to reject the FAT due to use of non-conforming, non-calibrated equipment.
- j. The Contractor must conduct a burn-in test of the electronics equipment as part of the FAT.
- k. The burn-in test method must be 48 hours continuous, failure free, at a minimum elevated ambient temperature of +40° C, or 24 hours continuous, failure free, if the temperature is cycled from -10° C to +40° C, or only at the acceptance by CCG an equivalent burn-in test may be used. If an existing equivalent burn-in test is planned, provide a detailed description with the bid.
- l. The Contractor must advise the CCG of the cause of any failure, and the corrective action taken.



- m. In the event that the equipment fails to pass any portion of the testing program, the problems must be rectified and appropriate re-testing occur.
- n. The Contractor must provide a FAT Report, in a format that correlates with the previously submitted detailed FAT Procedure(s) and clearly demonstrates how the equipment configurations have met the contract requirements.
- o. The completed FAT Report must be approved before the equipment can be shipped to the CCG.
- p. Once approved the Contractor must provide one (1) soft copy of the CCG-approved FAT Report in French.

#### **4.5.7 INNAV Interface Test**

4.5.7.1 The IIT must take place at the CCG Test Lab, and consist of a full system test with the INNAV interface, and demonstration of compliance with the SOW, TSORS and RADAR Equipment ITSG-33 Requirements.

#### **4.5.8 Site Acceptance Tests**

4.5.8.1 The Contractor must perform Site Acceptance Tests (SATs) in order to demonstrate to the CCG that the RADAR Equipment meets all of the operational and technical requirements, in accordance with the TSORs, ITSG-33 requirements and SOW.

4.5.8.2 The SAT must be conducted directly after each of the thirty-four (34) RADAR site installations identified in section 4.2.3 not including the CCG College.

4.5.8.3 The Contractor must develop test methods and procedures in order to demonstrate that the RADAR Equipment meet all of the operational and technical requirements in accordance with the Specifications, as follows:

- a. The SAT procedure must include initial RADAR System optimization for each installation.
- b. The Contractor must make any necessary corrections, adjustments, alignments or parameter changes needed to ensure that the integrated pieces of new RADAR Equipment functions optimally as a RADAR System.
- c. Once the RADAR System is optimized, the Contractor must conduct preliminary operational tests prior to the formal SAT.
- d. The results of these tests must be presented to CCG and will be the basis upon which CCG provides approval for the Contractor to conduct a formal SAT.
- e. If the stated operational requirements are not met, CCG may require improvements in the performance before providing approval to conduct a formal SAT.
- f. The SAT procedure must include a set of operational tests that demonstrate to Operations that the RADAR is service ready.
- g. Each SAT must include operational and system verification locally at the remote equipment site and via the INNAV operator console at the associated MCTS Centre.
- h. The Contractor must provide a draft SAT Plan ([DID TE-02](#) – *Test Plan and Report*) and

Procedure ([DID TE-03](#) – *Acceptance Test Procedures*) including all optimization parameters in accordance with the requirements, one (1) soft copy in English to CCG TA within forty (40) days after successful FATs.

- i. The SAT Plan and Procedures must be accepted by the CCG TA and PM before any SAT is performed.
- j. Printed copies of the Test Procedures must be supplied to the CCG witnesses during tests.
- k. As part of the SAT, the system must be submitted to a burn-in test of 48 continuous hours of operation.
- l. If a failure occurs during the SAT, the Contractor must correct or replace defective RADAR Equipment at their expense. A SAT must be repeated with the corrected units.
- m. The Contractor must provide a SAT report for each RADAR System within ten (10) days after completion.
- n. The SAT report must contain the test conditions, results and optimization parameter values.
- o. For any SAT failure(s) at any site, CCG must be advised and the Contractor must take the necessary steps to assist in resolving any issue(s) in order to successfully conduct a new SAT.
- p. The Contractor must submit one (1) soft copy of the SAT report for each regional installation to CCG TA and provide one (1) soft copy and two (2) hard copies of the SAT report for each installation to the respective regional centre.
- q. Reports that are destined for locations within the St. Laurent sector must be in French.
- r. Reports for the CCG Test Lab must be in French and English.

4.5.8.4 Approval of the SAT at thirty-four (34) RADAR site locations identified in section 4.2.3 excluding the CCG Test Lab and College represent the CCG's official acceptance of the RADAR Equipment.

4.5.8.5 CCG Acceptance will be evidenced by a signed Acceptance Certificate for each location.

4.5.8.6 CCG will supply the test ships for each SAT as required.

## 4.5.9 Configuration Management

4.5.9.1 The following must be implemented as part of the Contractor's configuration management procedures:

- a. The Contractor must maintain an established configuration management program in accordance with ISO 10007:2017, Quality Management – Guidelines for Configuration Management, or equivalent.
- b. The Configuration Management Plan (CMP) must be in accordance with [DID CM-01](#) – *Configuration Management Plan* and may be included as a separate section in the Contractor's PMP.
- c. The Contractor must develop a FAT Configuration Document in English to detail the configurations of the equipment that will be used during the FAT to execute the test plan and procedures.

- d. The FAT Configuration Document must include software parameters used, a diagram of the RADAR equipment configuration and the list of assumptions made to simulate the GFE in the Contractor's environment.
- e. The FAT Configuration Document must be referenced in the FAT Plan and Procedures and included as an appendix to the FAT Procedures.
- f. The RADARs must be under configuration control following FAT.
- g. The Contractor must notify the CCG PM of any changes to the CCG RADAR Equipment baseline, (established during the initial FAT), in accordance with the contract Design Change/Deviation procedure [DID CM-04 – Change Requests](#).
- h. The Contractor must assume all costs associated with any modification to the RADAR Equipment baseline that is required to ensure the RADAR Equipment's safety or fitness for intended use or rectify the RADAR Equipment's failure to perform according to the Technical Specifications.
- i. PWGSC and the CCG must approve any changes before they can be implemented by the Contractor.
- j. All Configuration Control Notices must identify all affected documentation as well as other impacted areas of concern, including but not limited to: costs, sparring, electromagnetic interference/compatibility issues, equipment interfacing and equipment/system integration issues.
- k. A soft-copy of all modified documentation must be distributed to the CCG PM in English and French where applicable in accordance with the requirements outlined in [Appendix C 8.5 – Media of Delivery](#).

## 4.6 TRAINING

### 4.6.1 Training Courses

- 4.6.1.1 The Contractor must provide course materials and training for the technical and operational staff.
- 4.6.1.2 The Contractor must provide separate training courses for Operators and Technologists. There are separate training philosophies for Operators and Technologists.
- 4.6.1.3 Operator training will follow a "Train the Trainer" approach.
- 4.6.1.4 The Contractor must provide Operational training at the CCG College (CCGC), Sydney, NS.
- 4.6.1.5 Operational leads from each MCTS Region and CCGC will take part in training at the CCG College.
- 4.6.1.6 These Operation leads will then provide training for their colleagues at each MCTS Centre.
- 4.6.1.7 The Contractor must provide Three (3) "Train the Trainer" Operator's courses in English and one (1) "Train the Trainer" Operator's course in French.

4.6.1.8 The Contractor must provide the corresponding operational training materials in both English and French. The estimated duration of the Operator's course is a half (1/2) to one (1) day depending on the changes to the information displayed using the INNAV interface.

4.6.1.9 The Contractor must prepare training materials and courseware for the technical training course that identifies all necessary data and procedures in sufficient detail for normal operation and maintenance of the RADAR Equipment in accordance with [DID TT-03](#) – *Training Manuals*.

4.6.1.10 The technical training philosophy will be to train technical staff to replace LRU and return the RADAR Equipment to full operation.

4.6.1.11 The Contractor must assume that all CCG Maintenance Technologists: are graduated Electronic Technologists with backgrounds in electronics theory; have related field experience; and, possess comprehensive knowledge of the theories and principles of electronics, communication, informatics and basic electronic engineering techniques.

4.6.1.12 Technologists training must be instructor led training delivered by the Contractor.

4.6.1.13 The Contractor must provide technical training at each of the following five (5) locations: St. John's – Newfoundland; Dartmouth – NS; Québec City – QC; Sarnia – Ontario (ON); and Richmond or Victoria – BC.

4.6.1.14 The technical training must include eight (8) Technical courses conducted in English and two (2) Technical courses conducted in French. These courses are summarized as follows:

- a. Ten (10) - Technical courses (estimated 10 courses x 5 business day duration)
  - i. Eight (8) courses in English, two (2) each located at Atlantic (North sector) – St John's – Newfoundland; Atlantic (South sector) – Dartmouth – Nova Scotia; C&A (Great Lakes sector) – Sarnia – ON; and Western – Richmond or Victoria – BC.
  - ii. Two (2) courses in French, to be held at C&A (St. Laurent sector) – Québec City – QC.

4.6.1.15 The training courses must accommodate the following numbers of CCG personnel:

- b. Each Operational course up to 6 Operators
- c. Each Technical course up to 8 Technologists

4.6.1.16 Course dates must be determined and scheduled following contract award.

4.6.1.17 The Contractor must ensure that RADAR equipment is available for each pair of students during each training course for practical use and familiarization with the RADAR Equipment's functions and features.

4.6.1.18 The Contractor is responsible for providing the RADAR Equipment to be used during the training courses.

## **4.7 WARRANTY**

### **4.7.1 Warranty Repairs**

4.7.1.1 The warranty period must be on a per RADAR Equipment configuration basis and commences following the successful completion of the SAT for each remote site.

4.7.1.2 During the warranty period the Contractor has the following responsibilities:

- a. Return to the originating CCG destination the repaired or replaced RADAR Equipment submitted by the CCG within four (4) weeks of receipt of defective equipment;
- b. Provide a single point of contact, within Canada, to handle all defective equipment returns;
- c. Maintain a telephone support access line during normal Monday-Friday (non-holiday) working hours (10am to 3pm Eastern Standard Time (EST)) for call-ups for RADAR Equipment engineering support;
- d. Maintain an established RADAR Equipment repair facility(s) and technical support resources capable of supporting all equipment procured under this contract;
- e. Provide software and firmware upgrades as they become available;
- f. Provide for and communicate configuration control for any changes made to the hardware, firmware, software or supplied items and related documentation; and
- g. Provide a failure report indicating what the failed unit, module, or component was.
- h. The failure report must include: RMA number; part number; serial number; quantity (if applicable); site location; description of failure; and most likely cause.

### **4.7.2 Non-Warranty Repairs**

4.7.2.1 If the repair or replacement of any piece of defective equipment returned by the CCG is not covered under the warranty, the Contractor must obtain the authorization of the CCG or authorized representative and the PWGSC CA before performing the repair or replacement.

4.7.2.2 Non-warranty equipment repair or replacement work must be requested using a PWGSC-TPSGC 572 – Task Authorization Form.

4.7.2.3 For any authorized repair not covered by the warranty, the CCG must be invoiced for the repair.

## **4.8 POST-WARRANTY CONTRACTOR SUPPORT**

### **4.8.1 General**

4.8.1.1 It is expected the Contractor will provide support under a separate contract, after the warranty period or exercised options for warranty extensions, for all RADAR Equipment procured under this Contract, during the anticipated service life as defined in section 4.8.2.

4.8.1.2 The Contractor must provide a single point of contact for problem resolution.

## 4.8.2 In-Service Support Plan

4.8.2.1 The anticipated RADAR Equipment service life is at least twenty (20) years.

4.8.2.2 The Contractor must provide an In-Service Support Plan for a duration of ten (10) years after the warranty period and be renewable after the first ten (10) years in five (5) year increments.

4.8.2.3 This plan must address the following:

- a. A description of its Customer Service Policy;
- b. Cost Policy for repair or replacement of failed units, sub-units, or system components;
- c. Labour rates for support activities required by CCG during the In-Service Support agreement;
- d. Procedures for handling and returning defective equipment and accessories;
- e. The provision of software and firmware upgrades as they become available;
- f. The provision for and communication of configuration control for any changes made to the hardware, firmware, software or supplied items and related documentation during the RADAR Equipment's service life;
- g. The turnaround time to repair or replace and ship to the CCG any module or equipment sent to the Contractor by the CCG;
- h. Provision of a failure report as described in section 4.7.1.2g;
- i. Provision of an itemized list of repairable assemblies, sub-units and major system components and their cost to repair or replace;
- j. Provision of regular repair status reports on a quarterly basis. This report must be a summary of item (h.) above;
- k. The Contractor must include, as an option, the maintenance of a Canadian Representative as a single point of contact to whom the CCG will forward defective or failed equipment for processing, where the Contractor does not maintain an existing single point of contact, within Canada, to handle all defective equipment returns; and
- l. The Contractor must include, as an option, field support service calls to RADAR sites to replace defective or failed equipment, identifying response times.

4.8.2.4 The Contractor must provide a cost model for demonstrating and optimizing the requirement for equipment spares for the twenty (20) year expected operational life versus, and in conjunction with, an In-Service Support Plan.

4.8.2.5 For the purpose of developing the cost model, it must be assumed that an In-Service Support Plan is renewable after the first ten (10) years in five (5) year increments.

4.8.2.6 The In-Service Support Plan along with pricing must be presented at the ISSR meeting.

## 4.8.3 End of Product Life

4.8.3.1 The Contractor must ensure that the RADAR Equipment manufacturer maintains access to



sufficient hardware manufacturing capability to provide long-term availability of parts for maintenance and repair.

4.8.3.2 The Contractor must inform the CCG when the RADAR Equipment manufacturer becomes aware that continued availability of spare parts is, or becomes, in jeopardy, a year in advance of end production runs so that CCG has time to purchase sufficient spares as determined by the CCG for support until end-of-life.

#### **4.8.4 Maintenance**

4.8.4.1 The CCG's maintenance philosophy for the equipment procured under this Contract is to ensure that CCG Technologists will be able to diagnose and replace any defective RADAR Equipment to the LRU, and restore RADAR Systems to their baseline condition as detailed in the associated specification.

4.8.4.2 The Contractor must maintain an established RADAR Equipment repair facility(s) and technical support resources capable of supporting all equipment procured under this Contract.

4.8.4.3 The Contractor must establish and provide the procedures for handling and returning defective RADAR Equipment.

4.8.4.4 The Contractor must repair or replace equipment returned by the CCG within four (4) weeks of receipt at the Contractor's designated facility.

4.8.4.5 The Contractor must ship repaired or replaced equipment to the originating CCG regional maintenance centre complete with a detailed failure and repair report.

4.8.4.6 The Contractor must provide reports of all maintenance records for any delivered or repaired RADAR Equipment when requested by CCG.

### **4.9 ENVIRONMENTAL REQUIREMENTS**

#### **4.9.1 General**

4.9.1.1 The Government of Canada (GOC) is taking the initiative with respect to dealing with electronic equipment, either directly or indirectly, through programs promoting green procurement and product stewardship.

4.9.1.2 The Contractor must adhere to the applicable environmental protection standards pertaining to the CCG RADAR and interface equipment as outlined in this section and use best practices for material selection, installation and construction to mitigate negative impacts on the environment.

#### **4.9.2 Contractor Environmental Commitment**

4.9.2.1 Environmental Management System – The Contractor must have a documented Environmental Management System in accordance with the requirements of ISO 14001, or equivalent.

4.9.2.2 Environmental Policy – The Contractor must have an up-to-date, documented

Environmental Policy including commitment to environmental protection, prevention of pollution, compliance with environmental legislation and continuous improvement.

4.9.2.3 The Contractor must be able to provide evidence of implementing the policy.

4.9.2.4 The Contractor must prepare and submit an emergency response plan as well as an environmental protection plan that reflect the Environmental Management System and Policy of the company.

### **4.9.3 Power Consumption**

4.9.3.1 The Contractor must disclose the average, minimum and maximum power consumption information of their products for each mode of operation.

### **4.9.4 Promote Materials Reduction**

4.9.4.1 The Contractor must document and quantify any use of recycled material in the plastic housing or other components of the equipment being submitted under this Contract.

4.9.4.2 The Contractor must identify whether its packaging uses reduced and/or recycled packaging for shipping; e.g., boxes that contain 35% post-consumer fibre for corrugated cardboard.

4.9.4.3 The Contractor must minimize quantity and weight of any non-recyclable packaging and shipping material; e.g., use of moulded paper or cardboard substitutes for polystyrene and styrofoam.

### **4.9.5 Recycling**

4.9.5.1 Contractor must document whether components are embossed with their material contents to facilitate end-of-life recycling.

### **4.9.6 Hazardous Materials**

4.9.6.1 The Contractor must disclose all hazardous materials and their amounts included in the equipment under this procurement.

4.9.6.2 The Contractor must provide Material Safety Data Sheets (MSDS) for all hazardous materials included in the equipment under this procurement.

4.9.6.3 The Contractor must ensure minimum use of all hazardous materials in their product.

4.9.6.4 The Contractor must disclose all regulated substances and their amounts included in the equipment under this procurement; e.g., Polychlorinated biphenyls (PCB's).

### **4.9.7 On-Site Activities**

4.9.7.1 The Contractor must not disturb any habitat or sensitive ecology on-site. If any damage occurs, the Contractor is responsible to restore the site(s) to its original state.

4.9.7.2 The Contractor must remain at all times on established pathways, walking areas, driving and parking areas.



## 5 OPTIONAL ITEMS

5.1 The Contractor must provide the optional items identified below if ordered by CCG.

### 5.1.1 Optional Technical and Operational Training

5.1.1.1 In addition to the training specified in section 4.6, the Contractor must provide an option for additional training to be delivered by the Contractor at any or all of the following five (5) locations: Placentia or St. John's – Newfoundland; Dartmouth – NS; Québec City – QC; Sarnia – ON; and Richmond or Victoria – BC.

5.1.1.2 The additional training must include eight (8) Technical and eight (8) Operational courses conducted in English; and two (2) Technical and two (2) Operational courses conducted in French. These additional courses are summarized as follows:

- a. Ten (10) - Technical courses (estimated 10 courses x 5 business day duration)
  - i. Eight (8) courses in English, two (2) each located at Atlantic (North sector) – St John's – Newfoundland; Atlantic (South sector) – Dartmouth – NS; C&A (Great Lakes sector) – Sarnia – ON; and Western – Richmond or Victoria – BC.
  - ii. Two (2) courses in French, to be held at C&A (St. Laurent sector) – Québec City – QC.
- b. Ten (10) - Operational courses (estimated 10 courses x 1 day duration)
  - i. Eight (8) courses in English, two (2) each located at Atlantic (North sector) – Placentia or St John's – Newfoundland; Atlantic (South sector) – Dartmouth – NS; C&A (Great Lakes sector) – Sarnia – ON; and Western – Victoria – BC.
  - ii. Two (2) courses in French, to be held at C&A (St. Laurent sector) – Québec City – QC.

5.1.1.3 The training material and curriculum must be the same as described under Training, section 4.6.

### 5.1.2 Optional RADAR Equipment

5.1.2.1 The Contractor must provide an option to purchase RADAR Equipment Configurations for up to five (5) additional remote site deployments with associated MCTS centre equipment.

5.1.2.2 The Contractor must deliver the optional RADAR Equipment complete with all instructions, materials, parts and assemblies, and applications necessary for its installation, optimization, SAT, operation and sparing as per the other sites and in accordance with the Supply Plan, [Appendix F](#).

5.1.2.3 The Contractor must submit with the bid an option with pricing to purchase RADAR Antenna Systems with the capability to switch between horizontal and circular polarization if this capability is available for the various antenna sizes.

5.1.2.4 The Contractor must submit with the bid an option with pricing for signaling RACONs to inhibit transmission, as defined in the RADAR Transceiver and Antenna TSOR.

5.1.2.5 As defined in the RADAR Transceiver and Antenna TSOR, the Contractor is asked to provide an option with pricing for a mechanical lock which would prevent the Antennas at each of the remote sites from turning during maintenance occurrences with a person aloft.

### **5.1.3 Optional Services Support**

5.1.3.1 The Contractor must provide an option for additional Integration/Installation Service Support that includes the installation, system and communication controls integration and optimization, system verification testing and issues resolution of the RADAR System, if requested by CCG. This option would be used on a site-by-site basis and only in the circumstances where CCG may lack the interim internal staffing capacity to perform these sets of activities.

### **5.1.4 Optional Warranty**

5.1.4.1 In addition to the Warranty period specified in the Contract for each RADAR Equipment unit, the Contractor must provide an option for seven (7) years of additional warranty with the same level of coverage as per section 4.7 in one (1) year increments.

### **5.1.5 Optional Canadian Point of Contact**

5.1.5.1 The CCG desires that the Contractor provides access to a Canadian point of contact to which the CCG can send items for repair. If this capacity doesn't exist, the Contractor must provide, as an option, a single point of contact within Canada to which the CCG will forward defective or failed equipment for repair, for the duration of the expected in-service life of the deployed RADAR Equipment.

## APPENDIX A LIST OF ACRONYMS

ACM	Asset Class Manager
AMS	Asset Management System
BC	British Columbia
BIST	Built-In Self-Test
C&A	Central and Arctic
CA	Contract Authority
CCG	Canadian Coast Guard
CCGC	Canadian Coast Guard College
CCITT	International Telegraph and Telephone Consultative Committee
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CD-ROM	Compact Disc, Read Only Memory
CIA	Confidentiality, Integrity, Availability
CM	Configuration Management
CMP	Configuration Management Plan
COTS	Commercial off the Shelf
CSA	Configuration Status Accounting
DFO	Department of Fisheries and Oceans
DID	Data Item Description
E&I	Electronics and Informatics
EKME	Electronic Knowledge Management Environment
EST	Eastern Standard Time
FAT	Factory Acceptance Test
FRR	FAT Readiness Review
FY	Fiscal Year
GFE	Government Furnished Equipment
GOC	Government of Canada
HMI	Human Machine Interface
HQ	Headquarters
IIRR	INNAV Interface Readiness Review
IIT	INNAV Interface Test
INNAV	Information System on Marine Navigation
IP	Internet Protocol
IRR	Installation Readiness Review
ISSR	In-Service Support Review
ITS	Integrated Technical Services

ITSG	Information Technology Security Guidance
IVEF	Inter-VTS Exchange Format
LCM	Life Cycle Manager
LLRU	Lower Line-Replaceable Unit
LRU	Line-Replaceable Unit
MCP	Maintenance Control Position
MCTS	Marine Communications and Traffic Services
MM	Maintenance Management
MMET	Marine Maintenance Equipment Training
MPS	Master Project Schedule
MSDS	Material Safety Data Sheets
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
NS	Nova Scotia
NSM	National Spares Management
NTP	Network Time Protocol
OCP	Operator Control Position
OEM	Original Equipment Manufacturer
ON	Ontario
OPI	Office of Primary Interest
OpNet	CCG's Operational Network
PCB	Polychlorinated biphenyl
PDF	Portable Document Format
PDR	Preliminary Design Review
PFR	Post FAT Review
PM	Project Manager
PMBOK®	Project Management Body of Knowledge Guide
PMP	Project Management Plan
PPR	Project Progress Report
PRINCE2®	Projects In a Controlled Environment
PRM	Project Progress Review Meeting
PWGSC	Public Works and Government Services Canada
QC	Québec
R&M	Reliability and Maintainability
RMA	Return Material Authorization
RML	Recommended Material List
ROI	Return on Investment
RSPL	Recommended Spare Parts List

SAT	Site Acceptance Test
SNMP	Simple Network Management Protocol
SOW	Statement of Work
SPM	Spares Provisioning Meeting
SRCL	Security Requirements Check List
STTEL	Special Tools and Test Equipment List
TA	Technical Authority
TDM	Technical Data Management
TDRL	Training Devices Requirements List
TE	Test Engineering
TIFF	Tagged Image File Format
TRR	Training Readiness Review
TSOR	Technical Statement of Requirements
TT	Technical Training
VTMIS	Vessel Traffic Management Information System
V&V	Verification and Validation
WBS	Work Breakdown Structure

DRAFT

## APPENDIX B DELIVERABLES LIST

Language Requirements	REGION	HEADQUARTERS	CCG TEST LAB	CCG COLLEGE	ATLANTIC REGION		CENTRAL and ARCTIC REGION		WESTERN REGION
	SECTOR  DELIVERABLES	Canadian Coast Guard 200 Kent Street Ottawa, ON K1A 0E6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard Telecom Engineering Workshop Sydney, NS B1R 2L6	Sector North  Canadian Coast Guard c/o Technical Stores 280 Southside Road St. John's, NL A1C 5X1	Sector South  Canadian Coast Guard Telecom Engineering Workshop 13 Akerly Blvd., Door 2 Dartmouth, NS B3B 1S6	St. Laurent  Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Great Lakes and Arctic  Canadian Coast Guard 1355 Confederation Street, Unit 8 Sarnia, Ontario, N7S 4T2	Victoria / Comox  Canadian Coast Guard E&I Engineering / Elec. Workshop 25 Huron St., / 299 Wireless Rd, Victoria, BC / Lazo, BC V8V4V9 / V0R2K0
QUANTITIES									
EQUIPMENT	XCVR – 1 + 1 Redundant Transceivers,								
	RADAR Transceiver (Redundant Configuration)		1 XCVR (1 of ea.)	1 XCVR min.	7 XCVR	9 XCVR	4 XCVR	1 XCVR	13 XCVR
	RADAR Transceiver Spares (Individual Units)				1 (½+ XCVR) min.	1 (½+ XCVR) min.	1 (½+ XCVR) min.		1 (½+ XCVR) min.
	Extractor (Redundant Configuration)		1	1 min.	Configuration TBD by Contractor	Configuration TBD by Contractor	Configuration TBD by Contractor	Configuration TBD by Contractor	Configuration TBD by Contractor
	Extractor Spares				1 min.	1 min.	1 min.	1min.	1 min.
	Antenna System (Combined Antenna and Turning Unit, where applicable)		1	1	7	9			13
	Antenna Spares				1 of ea. type	1 of ea. type			1 of ea. type
	Turning Unit Spares, where applicable				1 of ea. type	1 of ea. type			1 of ea. type
	Remote Site Maintenance Display/Computing Resources		1	1	7	9	4	1	13
	Operations Centre Maintenance Display/Computing Resources		1	1	3	2	2	1	2
	Remote Site Maintenance Display/Computing Resource Spares				1	1	1	1	1
	Operations Centre Maintenance Display/Computing Resource Spares					1	1		1
	RADAR Equipment Independent Software Applications				**(Unlimited replication and usage licence for internal distribution and installation.)				
	Ex. Maintenance and Information Display Application	S**							
	Ex. Transceiver Control Interface Application	S**							
	And Other Applications if any to be identified as necessary	S**							
DOCUMENTATION* (S = SOFT COPY, H = HARD COPY)	S = SOFT COPY(Unlimited replication and printing licence for internal distribution.), H = HARD COPY								
	Project Management Plan, Schedule and Configuration Management Plan	S / H							
	Project Risk Management Plan	S / H							
	Monthly Project Progress Reports	S / Month							
	Supplier COTS - as is technical documentation supplied with bid.								
	Drawings and Technical Data (NOTE 1)	S							
	Equipment Technical Publications (NOTE 2)	S							
	System Manuals	S							
	Equipment Manuals	S							
	Software User Manual	S							
	Equipment/System Interface Specifications	S							
	Equipment Manual (Tailored for CCG)	S							
	System Manual (Tailored for CCG)	S							
	Software Documentation (Tailored for CCG)	S							
	Maintenance Plan	S							
	Special Tools and Test Equipment (STTE)	S							
	Recommended Spares, Tools and Test Equipment List	S							
	In-Service Support Plan and Sparing Optimization Analysis Cost Model	S							
	Technical Review Materials								
	PDR	S							
	CDR	S							
ENGLISH	Unit Production Test Results				1 S and 1 H for each unit				
	RADAR Equipment Verification and Validation Test Results				1 S and 1 H for each different configuration				

Language Requirements	REGION	HEADQUARTERS	CCG TEST LAB	CCG COLLEGE	ATLANTIC REGION		CENTRAL and ARCTIC REGION		WESTERN REGION	
	SECTOR				Sector North	Sector South	St. Laurent	Great Lakes and Arctic	Victoria / Comox	
	DELIVERABLES	Canadian Coast Guard 200 Kent Street Ottawa, ON K1A 0E6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard Telecom Engineering Workshop Sydney, NS B1R 2L6	Canadian Coast Guard c/o Technical Stores 280 Southside Road St. John's, NL A1C 5X1	Canadian Coast Guard Telecom Engineering Workshop 13 Akerly Blvd., Door 2 Dartmouth, NS B3B 1S6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard 1355 Confederation Street, Unit 8 Sarnia, Ontario, N7S 4T2	Canadian Coast Guard E&I Engineering / Elec. Workshop 25 Huron St., / 299 Wireless Rd, Victoria, BC / Lazo, BC V8V4V9 / V0R2K0	
	FAT Plan & Procedures	QUANTITIES 1 S								
	Factory Acceptance Testing (FAT)	1 S and 1 H, Conduct as per section 4.5.6								
	FAT Results Reports	1 S and 1 H for each different configuration as per section 4.5.6								
	IIRR (Test Lab)									
	Drawings and Associated Lists	1 S	1 S, 2 H							
	Installation Drawings and Instructions	1 S	1 S, 2 H							
	INNAV Interface Test Results Report (CCG Test Lab)	System acceptance test performed including ITSG-33, INNAV interface								
	IIT Results Report	1 S	1 S, 2 H							
	AMS (Complete MAXIMO Data List)	Electronic Data as per section 4.1.7								
	Training Plan	1 S		1 S, 2 H						
	Technical Training Package	1 S		1 S, 2 H						
	Operational Training Package	1 S		1 S, 2 H						
	Training Course Material	1 S	1 S, 1 H for each student	1 S, 2 H	1 S, 1 H for each student	1 S, 1 H for each student	1 S, 1 H for each student	1 S, 1 H for each student	1 S, 1 H for each student	
	IRRs (34 sites)	S								
	Drawings and Associated Lists	1 S for each site			1 S for each regional site (7)	1 S for each regional site (9)	1 S for each regional site (4)	1 S for each regional site (1)	1 S for each regional site (13)	
	Installation Drawings and Instructions	1 S for each site			1 S for each regional site (7)	1 S for each regional site (9)	1 S for each regional site (4)	1 S for each regional site (1)	1 S for each regional site (13)	
	SAT Plan & Procedures	1 S								
	Site Acceptance Test (SAT) (All 34 Sites)	Conducted at respective regional sites after each installation as per section 4.2.3 and 4.2.6								
	SAT Results Reports									
	Atlantic - North (7separate SATs)	1 S of each site(7)			(1 S, 2 H) / Reg. site(7)					
	Atlantic - South (9 separate SATs)	1 S of each site(9)				(1 S, 2 H) / Reg. site(9)				
	C&A - St. Laurent (4 separate SATs)	1 S of each site(4)					(1 S, 2 H) / Reg. site(4)			
	C&A - Great Lakes (1 separate SAT)	1 S of each site(1)						(1 S, 2 H) / Reg. site(1)		
	Western (13 separate SATs)	1 S of each site(13)							(1 S, 2 H) / Reg. site(13)	
	SERVICES									
	Project Management	As per Section 4.4								
	Training	As per Section 4.6								
	Technical Training Course (Instructor Led)		1 at the Test Lab		2 for each regional Sector	2 for each regional Sector		2 for each regional Sector	2 for each regional Sector	
	Operational Training Course (Train the Trainer)			3 at the College						
	INNAV Interface Development Support		As per Section 4.2.2							
	Installation Service Support	Estimated up to 180 days total as per section 4.2.3, includes Installation Verification and Site Parameter Optimization								
	Field Support Services	As per Section 4.2.8								
	Warranty (first year) - Including RMA costs	As per Section 4.7								
	OPTIONAL ITEMS									
	Technical and Operational Training	As per Section 5.1.1								
	RADAR Equipment	As per Section 5.1.2								
	Services Support									
	Field Service Support	As per Section 5.1.3								
	Integration/Installation Services Support	As per Section 5.1.3								
	Warranty	As per Section 5.1.4								

Language Requirements	REGION	HEADQUARTERS	CCG TEST LAB	CCG COLLEGE	ATLANTIC REGION		CENTRAL and ARCTIC REGION		WESTERN REGION	
	SECTOR				Sector North	Sector South	St. Laurent	Great Lakes and Arctic	Victoria / Comox	
	DELIVERABLES	Canadian Coast Guard 200 Kent Street Ottawa, ON K1A 0E6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard Telecom Engineering Workshop Sydney, NS B1R 2L6	Canadian Coast Guard c/o Technical Stores 280 Southside Road St. John's, NL A1C 5X1	Canadian Coast Guard Telecom Engineering Workshop 13 Akerly Blvd., Door 2 Dartmouth, NS B3B 1S6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard 1355 Confederation Street, Unit 8 Sarnia, Ontario, N7S 4T2	Canadian Coast Guard E&I Engineering / Elec. Workshop 25 Huron St., / 299 Wireless Rd, Victoria, BC / Lazo, BC V8V4V9 / V0R2K0	
		QUANTITIES								
	Canadian Point of Contact	As per Section 5.1.5								
FRENCH	<b>Documentation</b>	<b>S = SOFT COPY(Unlimited replication and printing licence for internal distribution.), H = HARD COPY</b>								
	Equipment Manual (Tailored for CCG)	S								
	System Manual (Tailored for CCG)	S								
	Software Documentation (Tailored for CCG)	S								
	Maintenance Plan	S								
	Special Tools and Test Equipment (STTE)	S								
	Recommended Spares, Tools and Test Equipment List	S								
	In-Service Support Plan and Sparing Optimization Analysis Cost Model	S								
	FAT Plan & Procedures									
	Factory Acceptance Testing (FAT)	Conducted for each of the different equipment configurations. CCG to be present at Contractor facility for the FAT.								
	FAT Results Reports	S								
	IIRR (Test Lab)	S								
	Drawings and Associated Lists	S, 1 H	S, 2 H							
	Installation Drawings and Instructions	S	S							
	INNAV Interface Testing (IIT) (CCG Test Lab)	System acceptance test, full SAT performed including ITSG-33, INNAV interface and OCP								
	IIT Results Report	S	S, 1 H							
	Training Plan	S		S, 2 H						
	Technical Training Package	S		S, 2 H						
	Operational Training Package	S		S, 2 H						
	Training Course Material	S		S, 1 H per student						
	IRRs (4 systems in St. Laurent Sector)									
	Drawings and Associated Lists	S					S for each regional site (4)			
	Installation Drawings and Instructions	S for each site					S for each regional site (4)			
	SAT Plan & Procedures	S					S			
	Site Acceptance Test (SAT)						As per section 4.2.3 and 4.2.6			
	SAT Results Reports									
	C&A - St. Laurent (4 separate SATs)	1 S of each site(4)					1 S of each site(4)			
	<b>SERVICES</b>									
	Training	As per Section 4.6								
	Technical Training Course (Instructor Led)						2 for each regional Sector			



Language Requirements	REGION	HEADQUARTERS	CCG TEST LAB	CCG COLLEGE	ATLANTIC REGION		CENTRAL and ARCTIC REGION		WESTERN REGION	
	SECTOR  DELIVERABLES	Canadian Coast Guard 200 Kent Street Ottawa, ON K1A 0E6	Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Canadian Coast Guard Telecom Engineering Workshop Sydney, NS B1R 2L6	Sector North  Canadian Coast Guard c/o Technical Stores 280 Southside Road St. John's, NL A1C 5X1	Sector South  Canadian Coast Guard Telecom Engineering Workshop 13 Akerly Blvd., Door 2 Dartmouth, NS B3B 1S6	St. Laurent  Garde Cotiere Canadienne 101 Blvd Champlain Quebec, QC G1K 7Y7	Great Lakes and Arctic  Canadian Coast Guard 1355 Confederation Street, Unit 8 Sarnia, Ontario, N7S 4T2	Victoria / Comox  Canadian Coast Guard  E&I Engineering / Elec. Workshop 25 Huron St., / 299 Wireless Rd, Victoria, BC / Lazo, BC V8V4V9 / V0R2K0	
		QUANTITIES								
	Operational Training Course (Train the Trainer)		1 at the College							
	INNAV Interface Development Support		As per Section 4.2.2							
	Installation Service Support	Estimated up to 180 days total as per section 4.2.3, includes Installation Verification and Site Parameter Optimization								
	Field Support Services	As per Section 4.2.8								
	Warranty (first year) - Including RMA costs	As per Section 4.7								
	OPTIONAL ITEMS									
	Technical and Operational Training	as per section 5.1.1								
	Services Support									
	Field Service Support	As per Section 5.1.3								
	Integration/Installation Services Support	As per Section 5.1.3								
	Canadian Point of Contact	As per Section 5.1.5								
	NOTES									
	NOTE 1: Drawings and Technical Data includes but is not limited to: Equipment technical specifications, asset drawings, & Installation Drawings.									
	NOTE 2: Equipment Technical Publications includes but is not limited to: equipment description, installation instructions, operating instructions, preventative maintenance, corrective maintenance, illustrated parts list, software user instructions, & software maintenance manual.									
	* Unlimited Reproduction Licence for internal distribution only (E-version)									

## **APPENDIX C DATA & DOCUMENTATION FORMATS**

### **C.1 LANGUAGE**

All technical publications pertaining to the asset, its equipment and systems must be provided in English and in French, the official languages of Canada. Where the original documentation is only available in one of the official language, the Contractor shall make arrangements for the translation of the documents. The Contractor must certify that qualified personnel other than the original translator have checked the accuracy and adequacy of translation(s). The Contractor must correct any errors or omissions in the translated documents at its own cost.

### **C.2 PUBLICATION ACCEPTANCE**

The use of existing commercial publications is acceptable providing that they meet the requirements listed herein, and that the existing manuals are complete and in evidence at the time of the contract award. Existing manuals shall be subject to review and acceptance by the CCG Technical Authority. If the Publications and Lists cannot be accepted, for reasons of either legibility, technical content or format, the Contractor may be asked to resubmit hardcopy publication sets with the necessary changes or create additional documentation to be deemed acceptable.

### **C.3 DATA RIGHTS**

Canada shall have rights to use the data delivered as required by this SOW per the terms contained in the Contract.

### **C.4 ACCEPTANCE AND QUALITY ASSURANCE**

#### **C.4.1 In Process Reviews**

All data deliverables shall be reviewed for acceptance by the Project Authority.

#### **C.4.2 Quality Assurance**

Acceptance of the data by Canada shall in no way relieve the Contractor of his/her responsibility for data quality and the correction of data should deficiencies be detected within the contract and warranty period.

### **C.5 MAIL DELIVERY**

Deliverables shall be forwarded to:

Canadian Coast Guard,  
200 Kent Street, Mail Stop 7S036  
OTTAWA, ON  
K1A 0E6

Attention: CCG Project Manager – National RADAR Equipment Procurement Project

## **C.6 MEDIUM**

Data shall be acquired in hard copy and soft copy form and in the quantities as specified in Appendix B – Deliverable List.

## **C.7 HARD COPY**

Hard copy data and documents shall be acquired, such that CCG shall not be required to reproduce the data and documents to meet its immediate in-service needs.

## **C.8 SOFT COPY**

Each hardcopy publication submitted by the Contractor shall be provided in soft copy and shall be formatted in accordance with the following requirements.

### **C.8.1 Master Document Files**

The Master Document Files are the electronic master of the completed publication and lists. Master document files must be delivered in their native file format (e.g. MS Word, MS Excel, MS PowerPoint). All blank pages, figures, illustrations and foldouts must be imbedded within the file(s). These files are considered the “Master Document” files for present and future revision, changes and/or re-use. The Master Document files may be broken down into a number of folders and sub-files in order to ensure the file sizes can be managed on the normal office word processor. Files should be broken at logical page locations to ensure future ease of use. This would normally occur at the end of a part/chapter or section.

### **C.8.2 Master Image Files**

All illustrations (Figures) must be delivered as separate individual Tagged Image File Format (TIFF) images in accordance with Adobe Systems Inc. specification “TIFF Revision 6”, compressed to International Telegraph and Telephone Consultative Committee (CCITT) Group 4. Files shall be UNTILED and must be wholly raster (hybrid files shall not be delivered).

Image sizes as outlined in C.8.10 are provided as a guide and sizes may vary slightly, but no more than plus or minus one inch (25 mm) in either width or length.

### **C.8.3 Master Read Only Files**

Using the completed Master Document file(s), the Contractor must generate and provide a Portable Document Format (PDF) file that must contain the complete publication. This file(s) is considered the “Master Read Only” file for printing/reproduction/viewing purposes. All pages contained in the PDF file must be oriented such that they do not require rotation when viewing. This file shall contain “thumbnails” of each of the pages. The Master Read Only File is not a replacement for the Master Document files or the Master Image files. The Contractor must ensure that a quality check is done on the Read Only (such as PDF) file to verify that the content reflects the same content/formatting as the Master Document file and the Reproducible copy. As a minimum the table of content shall be hyperlinked to the applicable section, paragraph or sub paragraph as applicable.

### C.8.4 Metadata (Capture of Related Information)

Metadata (the data that describes data objects) must be provided for all publication and list deliverables. Metadata records must contain the information in the order shown in C.8.7 and C.8.9. Metadata must be delivered as a Microsoft Access data base table (preferred) or as a single delimited ASCII text file. Sample Metadata record entries are shown in C.8.8 and C.8.11.

### C.8.5 Media of Delivery

The media form for final delivery of electronic data (soft-copy) must be agreed to between CCG and the Contractor.

### C.8.6 Format of Data

Each delivered technical document, diagram or parts list must have a corresponding Metadata database record. All records must be entered into a single Microsoft Excel 2010 workbook. Fields without corresponding information shall remain blank. The Microsoft Excel 2010 database file shall be named "CCG RADAR documentation metadata.xlsx".

### C.8.7 Index Fields for Document Data Records

Order	Field Name	Field Definition / Description	Example Entry
1	<b>File Name</b>	Name of electronic file - unique filename for uploading in database.	<b>MZ000235.PDF</b>
2	<b>Document No</b>	This field shall contain the document number.	<b>MZ235</b>
3	<b>Page Number</b>	This field is used when documents have multiple Pages that are stored as separate files (e.g. multi-page illustrated parts list). Page number x of y. Enter the value of x.	<b>1</b>
4	<b>Number of Pages</b>	The total number of pages	<b>25</b>
5	<b>Revision</b>	Letter or number indicating the revision level. If there is no rev, indicate with dash ("-")	<b>B</b>
6	<b>Publication Date/Date of Issue</b>	This field is used to capture version information when version or revision identifiers are not recorded on the document (DD/MM/YYYY)	<b>22/02/2012</b>
7	<b>NSCM</b>	This field shall contain the NATO Supply Code for Manufacturers (NSCM) of the Owner of the data. (Also known as FSCM, CAGE or NCAGE code.)	<b>36219</b>
8	<b>Data Rights</b>	The data rights as specified in the contract. "L" for "LIMITED" or "U" for	<b>U</b>

		"UNLIMITED"	
9	<b>Document Name or Title (English)</b>	English Title of document.	<b>Antenna Installation and Repair Manual</b>
10	<b>Document Name or Title (French)</b>	French Title of document	

### C.8.8 Sample Record Entries

(The following table is shown on two lines to suit page width.)

#### Metadata (in database table)

FILE NAME	DOCUMENT NO	Page Number	Number of Pages	Revision	Publication Date/Date of Issue
MZ000235.PDF	MZ235	1	25	B	22/02/2012

NSCM	DATA RIGHTS	Document Name or Title (English)	Document Name or Title (French)
36219	U	Antenna Installation and Repair Manual	

### C.8.9 Index Fields for Diagram/Parts List Data Records

Order	Field Name	Max Field Length	Field Definition / Description	Example Entry
1	<b>FILE NAME</b>	25	Name of electronic file – unique filename for uploading in database.	<b>MZ000235.TIF</b>
2	<b>DOCUMENT NO</b>	25	This field shall contain the document number.	<b>9775458</b>
3	<b>REVISION</b>	3	Letter or number indicating the revision level. If there is no rev, indicate with dash (“-”).	<b>B</b>
4	<b>SHEET NO</b>	3	Sheet number x of y. Enter the value of x.	<b>1</b>
5	<b>NO OF SHEETS</b>	3	Sheet number x of y. Enter the value of y.	<b>1</b>
6	<b>FRAME NO</b>	3	Frame number x of y. Enter the value of x. (This field is applicable only when capturing data from aperture cards.) When field is not applicable, leave blank.	<b>1</b>
7	<b>NO OF FRAMES</b>	3	Frame number x of y. Enter the value of y. (This field is applicable only when capturing data from aperture cards.) When field is not applicable, leave blank.	<b>1</b>
8	<b>NSCM</b>	5	This field shall contain the NATO Supply Code for Manufacturers (NSCM) of the Owner of the data. (Also known as FSCM, CAGE or NCAGE code.)	<b>36219</b>
9	<b>SIZE</b>	2	This field contains the document size. -For imperial sizes use A, B, C, D, E, F, G, H, J, K and LE (for legal) -For metric sizes use A4, A3, A2, A1, A0 and B1.	<b>A2</b>
10	<b>ADDITIONAL IDENTIFIER</b>	10	This open field shall be used when two (2) or more documents have the same document number but are different documents. e.g. Document 12345, Document 12345 DCR 001, then “DCR 001” would be entered in this field. When field is not applicable, leave blank.	<b>DCR 001</b>
11	<b>DATA RIGHTS</b>	1	The data rights as specified in the contract. “L” for “LIMITED” or “U” for “UNLIMITED”	<b>U</b>
12	<b>DOCUMENT TITLE</b>	240	Title of document. (i.e. Drawing title)	<b>BRACKET ASSY</b>

## C.8.10 DRAWING SIZES

METRIC DRAWING SIZES			
Drawing Size	W x L (max) (mm)	Pels Per Line	Number of Lines
A4	210 X 297	1656	2344
A3	297 X 420	2344	3312
A2	420 X 594	3312	4680
A1	594 X 841	4680	6624
A0	841 X 1189	6624	9368
B1	707 X 1000	5567	7875
NORTH AMERICAN / IMPERIAL DRAWING SIZES			
Drawing Size	W x L (max) (inches)	Pels Per Line	Number of Lines
A	8.5 x 11	1704	2200
B	11 x 17	2200	3400
C	17 x 22	3400	4400
D	22 x 34	4400	6800
E	34 x 44	6800	8800
F	28 x 40	5600	8000
G	11 x 90	2200	18000
H	28 x 143	5600	28600
J	34 x 176	6800	35200
K	40 x 143	8000	28600
Legal	8.5 x 14	1704	2800

### C.8.11 Sample Drawing Record Entries

(The following table is shown on two lines to suit page width.)

#### Metadata (in database table)

FILE NAME	DOCUMENT NO	REVISION	SHEET NO	NO OF SHEETS	FRAME NO	NO OF FRAMES
MZ000235.TIF	9775458	B	1	1	1	1
MZ000236.TIF	9775457	-	1	1		

NSC M	SIZE	ADDITIONAL IDENTIFIER	DATA RIGHTS	DOCUMENT TITLE
36219	A2	DCR 001	U	BRACKET ASSY
36219	A1		U	BRACKET

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## APPENDIX D CONTRACT DATA REQUIREMENTS LIST AND DATA ITEM DESCRIPTIONS

Contractor (after contract award):		RFP/Contract:					Original/Amendment: Original	
CCG Project / Technical Authority:		Asset:					Dated:	
DID #	Title	SOW Ref.	How Often	Lang.	Submissions		R or I	Remarks
					Initial	Later		
Project Management								
<a href="#">PM-01</a>	Project Management Plan	<a href="#">4.3.2.1</a>	Twice + updates	Eng	With bid	Kick-Off +10 days	R	Maintained on an ongoing basis
<a href="#">PM-02</a>	Contractor Progress and Status Report	<a href="#">4.3.3.1</a> <a href="#">4.4.6.5</a>	M	Eng			I	Submitted five (5) days prior to Monthly Project Progress Review meeting
<a href="#">PM-03</a>	Risk Management Plan	<a href="#">4.3.2.2</a>	Twice + updates	Eng	With bid	Kick-Off +10 days	R	Maintained on an ongoing and monthly basis
Technical Data Management								
As Is Format	Drawings and Associated Lists - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			Successive submissions must document the:

<a href="#">TDM-02</a>	- CCG Tailored	<a href="#">4.3.12.5</a> <a href="#">4.4.16.4</a>	Thrice	Eng & Fre	IRR -5 days	Working copies in advance of installation	R	<ul style="list-style-type: none"> <li>Installation specifications</li> <li>3rd time as fitted post installation.</li> </ul>
<a href="#">TDM-03</a>	Equipment Installation Data Package - Site Specific (x28 sites)	<a href="#">4.3.12.5</a> <a href="#">4.4.16.4</a>	Twice	Eng & Fre	IRR -5 days	IRR +15 days	R	A data package is required for each differently configured equipment installation.
As Is Format	System Manuals - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			
<a href="#">TDM-05</a>	- CCG Tailored	<a href="#">4.3.7.1</a>	Twice	B	PDR -5 days	CDR -5 days	R	
As Is Format	Equipment Manuals - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			
<a href="#">TDM-06</a>	- CCG Tailored	<a href="#">4.3.6.1</a>	Twice	B	PDR -5 days	CDR -5 days	R	
As Is Format	Software Version Description Document - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			
<a href="#">TDM-07</a>	- CCG Tailored	<a href="#">4.3.8.2</a>	Twice	B	PDR -5 days	CDR -5 days	R	

As Is Format	Software User Manuals - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			
<a href="#">TDM-08</a>	- Tailored	<a href="#">4.3.8.1</a>	Twice	B	PDR -5 days	B for IIRR -5 days	R	
<b>Configuration Management</b>								
<a href="#">CM-01</a>	Configuration Management Plan	<a href="#">4.3.2.9</a> <a href="#">4.5.9.1b</a>	Twice	B	Eng with bid	Kick-Off +10 days	I	
<a href="#">CM-03</a>	Request for Clarification	<a href="#">4.3.2.12</a>	AR	Eng			I	
<a href="#">CM-04</a>	Change Request	<a href="#">4.3.2.10</a> <a href="#">4.4.3.5</a> <a href="#">4.5.9.1g</a>	AR	Eng			I	
<b>Engineering</b>								
<a href="#">SE-09</a>	Reliability Data	<a href="#">4.1.5.6</a> <a href="#">4.3.5.5</a> <a href="#">4.4.12.5</a>	Twice	Eng & Fre	SPM -5 days	SPM +15 days	R	Data set for each different system configuration.
<a href="#">SE-10</a>	Technical Review Preparations (PDR)	<a href="#">4.4.9.7</a>	Once	Eng & Fre	PDR -5 days		R	
	Technical Review Preparations (CDR)	<a href="#">4.4.10.3</a>	Once	Eng & Fre	CDR -5 days			
	Technical Review Preparations (IIRR)	<a href="#">4.4.11.4</a>	Once	Eng & Fre	IIRR -5 days			

As Is Format	Interface Specification - Supplier COTS	<a href="#">4.3.4</a>	Once	Eng/Fre	With bid			
<a href="#">SE-11</a>	- CCG Tailored	<a href="#">4.3.4.3</a>	Twice	Eng & Fre	PDR -5 days	IIRR -5 days	R	
<b>Test and Evaluation</b>								
<a href="#">TE-02</a>	Test Plan and Reports (FATs)	<a href="#">4.3.11.1</a> <a href="#">4.4.13.3</a> <a href="#">4.5.6.1a</a>	Twice	Eng & Fre	FRR -5 days	FRR +10 days	R	FAT Test Reports is due Test +10 days, French for equipment going to St. Laurent Sector
	Test Plan and Reports (SATs)	<a href="#">4.4.16.4</a> <a href="#">4.5.8.3h</a>	Twice	Eng & Fre	IRR -5 days	IRR +15 days	R	SATs Test Reports are due Test/ea. +10 days
<a href="#">TE-03</a>	Acceptance Test Procedures (FAT)	<a href="#">4.3.11.3</a> <a href="#">4.4.13.3</a> <a href="#">4.5.6.1a</a>	Twice	Eng & Fre	FRR -5 days	FRR +10 days	R	
	Acceptance Test Procedures (SAT)	<a href="#">4.4.16.4</a> <a href="#">4.5.8.3h</a>	Twice	Eng & Fre	IRR -5 days	IRR +15 days	R	
<b>Maintenance Management</b>								
<a href="#">MM-04</a>	Maintenance Plans	<a href="#">4.3.5.1</a>	Twice	Eng & Fre	SPM -5 days	SPM +15 days	R	
<a href="#">MM-05</a>	Preventive Maintenance Program	<a href="#">4.3.5.1</a>	Twice	Eng & Fre	SPM -5 days	SPM +15 days	I	

<a href="#">MM-06</a>	Calibration Requirements Report	<a href="#">4.3.5.1</a>	Once	Eng & Fre	SPM -5 days		I	
<b>Training</b>								
<a href="#">TT-02</a>	Training Devices Requirements List	<a href="#">4.3.9.5</a> <a href="#">4.4.15.5</a>	Twice	Eng & Fre	TRR -5 days	TRR +40 days	R	
<a href="#">TT-03</a>	Training Manuals	<a href="#">4.3.9.5</a> <a href="#">4.3.10.1</a> <a href="#">4.4.15.5</a> <a href="#">4.6.1.9</a>	Twice	Eng & Fre	TRR -5 days	TRR +40 days	R	

A = Annually	FRR = FAT Readiness Review	IIRR = INNAV Integration Readiness Review
AR = As Required	SPM = Spares Provisioning Meeting	TRR = Training Readiness Review
B = Final version shall be provided in both English and French language	I = Submitted for Information	R = Review and Acceptance Required
Eng / Fre = English only or French only	IRR = Installation Readiness Review	PDR = Preliminary Design Review
FAT = Factory Acceptance Test	M = Monthly	CDR = Critical Design Review
Lang. = Language	SAT = Site Acceptance Test	COTS = Commercial Off-the-Shelf
	Note: Frequency requirements do not include post-meeting revision requirements.	

NOTE: Submission requirements in this table do not include the revised submissions that may be required after submissions have been reviewed.

## PM-01 PROJECT MANAGEMENT PLAN

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Project Management Plan	2. <b>IDENTIFICATION NUMBER</b> PM-01
3. <b>PURPOSE</b> To describe the Contractor's project management methods and resources in accordance with PMBOK® Guide practices (or equivalent). This DID is to be used in conjunction with DIDs PM-02 and PM-03.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> 4.1 This DID is not meant to be restrictive, and may be tailored by the Contractor. 4.2 The resulting document may be prepared in the Contractor's format and shall contain sufficient detail to fully address the information requirements herein. 4.3 The Project Management Plan must include the following information <i>as a minimum</i> : 4.3.1 <b>Introduction</b> , including purpose, scope, references, definitions, acronyms, and plan update process. 4.3.1.2 List of project deliverables 4.3.2 <b>Project Organization</b> 4.3.2.1 Project Manager 4.3.2.2 Team Organization Chart, along with roles and responsibilities 4.3.2.3 Coordination, with the CCG Project Authority and PWGSC CA (ensuring an effective working relationship) 4.3.2.4 Project Sub-Contract Management Plan 4.3.3 <b>Work Plan</b> 4.3.3.1 Work Breakdown Structure (WBS) 4.3.3.2 Master Schedule, including milestones and summary level	

DATA ITEM DESCRIPTION	
1. TITLE Project Management Plan	2. IDENTIFICATION NUMBER PM-01
<p>modified Gantt chart, with all task dependencies</p> <p><b>Note:</b> Once the baseline schedule is submitted it shall be retained intact with all subsequent amendments sequentially numbered</p> <p><b>4.3.4 Project Control Methods</b></p> <p><b>4.3.4.1</b> Scope Control</p> <p><b>4.3.4.2</b> Integrated Change Control (internal processes to support requirements of DID PM-02)</p> <p><b>4.3.4.2</b> Work Progress Monitoring and Control</p> <p><b>4.3.4.3</b> Schedule Control</p> <p><b>4.3.4.4</b> Quality Management, including description of Integration and Test Plan</p> <p><b>4.3.4.5</b> Risk Management Plan (in accordance with DID PM-03)</p> <p><b>4.3.4.6</b> Project Document Control</p> <p><b>4.3.5 Issue Management</b>, including escalation process (See DID PM-02)</p> <p><b>4.3.6 Project Close Out</b></p> <p><b>4.3.6.1</b> Final Project Review</p>	

## PM-02 CONTRACTOR PROGRESS AND STATUS REPORT

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Contractor Progress and Status Report	2. <b>IDENTIFICATION NUMBER</b> PM-02
3. <b>PURPOSE</b> To evaluate progress and remain cognizant of the project's status. This report shall be used as an input to regular Project Progress Review meetings.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive and, with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.</p> <p>4.2 The resulting document may be prepared in a format acceptable to the CCG and shall contain sufficient detail to fully address the information requirements. Any parts that are not relevant to the current reporting period may be left blank.</p> <p>4.3 The report must include the following information:</p> <p>4.3.1 <b>Report Identification</b></p> <p>4.3.1.1 Report title, sequence number, date, Contractor</p> <p>4.3.2 <b>Project Status</b></p> <p>4.3.2.1 Period covered</p> <p>4.3.2.2 Status with respect to schedule</p> <p>4.3.2.3 Significant events during the reporting period</p> <p>4.3.2.4 Reporting period Project Risk Update (attach current Risk Matrix)</p> <p>4.3.3 <b>Project Changes</b></p> <p>4.3.3.1 Changes (if any) in project scope (since the previous report)</p> <p>4.3.3.2 Authorized changes (if any) to agreed schedule, technical objectives or deliverables</p> <p>4.3.3.3 Significant changes (if any) to the Contractor's organization or method of operation</p>	



DATA ITEM DESCRIPTION	
1. TITLE Contractor Progress and Status Report	2. IDENTIFICATION NUMBER PM-02
<p><b>Note:</b> Change Requests and status shall be tracked in the Issue Log/Action Items List</p> <p><b>4.3.4 Planned Next Period Activities</b></p> <p><b>4.3.4.1</b> Plans for activities during the following period (review Master Schedule)</p> <p><b>Note:</b> If the Master Schedule has been amended since last report it shall be attached to this report</p> <p><b>4.3.5 Issue Log/Action Items List (Spreadsheet)</b></p> <p><b>4.3.5.1</b> Significant problems encountered, including recommendations (if any) for CCG action</p> <p><b>4.3.5.2</b> Status of previously identified problems (not previously reported resolved)</p> <p><b>4.3.5.3</b> Any other action items arising from reviews, meetings, or correspondence between the CCG, CA, and the Contractor</p> <p><b>4.3.5.4</b> Change Request Tracking</p> <p><b>Note:</b> This list shall retain any closed items as an ongoing historical record. Action responsibility and due date are to be included as appropriate.</p>	

## PM-03 RISK MANAGEMENT PLAN

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Risk Management Plan	2. <b>IDENTIFICATION NUMBER</b> PM-03
3. <b>PURPOSE</b> <p>To establish a risk management methodology, organizational responsibility, and reporting requirements in accordance with PMBOK® Guide practices. This plan may be incorporated into DID PM-01 <i>Project Management Plan</i>.</p>	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive, and may be tailored by the Contractor.</p> <p>4.2 The resulting document may be prepared in the Contractor's format and shall contain sufficient detail to fully address the information requirements.</p> <p>4.3 The report must include the following information:</p> <p>4.3.1 <b>Introduction</b>, including purpose, scope, related plans, references, definitions, acronyms, and plan update process.</p> <p>4.3.2 <b>Risk Management Policy</b></p> <p>4.3.2.1 Overall Approach to Risk Management</p> <p>4.3.3 <b>Organizational Responsibility</b></p> <p>4.3.3.1 Risk Management Responsibilities</p> <p>4.3.3.2 Risk Management Meetings</p> <p>4.3.4 <b>Scheduled Milestones and Reviews</b></p> <p>4.3.4.1 Project Review Meetings, including Risk Management</p> <p>4.3.4.2 Technical Reviews and Audits, including Risk Management</p> <p>4.3.5 <b>Risk Management System</b></p> <p>4.3.5.1 Risk Register</p> <p>4.3.6 <b>Risk Management Process</b></p>	

DATA ITEM DESCRIPTION	
1. TITLE Risk Management Plan	2. IDENTIFICATION NUMBER PM-03
<p>4.3.6.1 Risk Identification, including number and description.</p> <p>4.3.6.2 Risk Analysis, including domain, impact/severity, probability, timeframe, and priority</p> <p>4.3.6.3 Risk Mitigation Plan, including risk “owner”</p> <p>4.3.6.4 Risk Tracking, including reporting back date and risk status</p> <p>4.3.6.5 Risk Resolution/Control</p> <p>4.3.6.6 Risk Communication</p> <p>4.3.7 Risk Mitigation Matrix (Note: to be appended to DID PM-02)</p> <p>4.3.7.1 Management Risks</p> <p>4.3.7.2 Technical Risks</p> <p>4.3.7.3 Schedule Risks</p> <p>4.3.7.4 Cost Risks</p> <p>4.3.7.5 Logistic Support Risks</p>	

## TDM-02      DRAWINGS AND ASSOCIATED LISTS

DATA ITEM DESCRIPTION	
1. TITLE Drawings and Associated Lists	2. IDENTIFICATION NUMBER TDM-02
3. PURPOSE To prescribe the format, content and scope requirements relating to preparation and submission of Drawings and Associated Lists.	
4. DATA PREPARATION INSTRUCTIONS <div><div>4.1 Drawings and associated lists must be compliant with the CCG Specification for Electronic Technical Data Deliverables<sup>1</sup>, Chapter 2. This Chapter prescribes:<ul style="list-style-type: none"><li>• Raster Format</li><li>• Vector Format</li><li>• Folder and File Names</li><li>• Metadata</li><li>• Medium of Delivery</li><li>• Data Rights (Unlimited and Limited)</li></ul></div><div>4.2 A family tree or equipment block diagram drawing must be provided that depicts, in a top-down breakdown block diagram, the parent-child relationships of the items in the drawing package.</div><div>4.3 Equipment drawings must include, <i>but not be limited to</i>, the following:<ul style="list-style-type: none"><li>• Mechanical drawings</li><li>• Equipment rack layouts</li><li>• Signal and connection block diagrams</li><li>• Schematic drawings, except as otherwise included in the equipment technical manuals</li><li>• Cable layouts</li><li>• Assembly drawings</li><li>• System interconnection diagrams</li><li>• Wire lists</li></ul></div><div>4.4 Parts Lists / Bills of Material must be provided in accordance with ASME Y14.34-2008.</div></div>	

<sup>1</sup> Note. Reference (CA-014-000-NU-TD-001).

- |  |
|--|
| <p><b>4.5</b> The drawing package shall provide full design disclosure and must include the drawing types as prescribed in the attached Drawing Types List example.</p> <p><b>4.6</b> Floor plan (may be marked up copies of the CCG-supplied floor plan).</p> |
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**Drawing Types List**

Item Description	Preliminary Design	Detailed Design	Final Design	As Fitted
-- to be completed for the particular acquisition --	- adapt columns as necessary			
Example:				
General Arrangement – Including floor plan and rack location	X	X	X	X

## TDM-03 EQUIPMENT INSTALLATION DATA PACKAGE

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Equipment Installation Data Package	2. <b>IDENTIFICATION NUMBER</b> TDM-03
3. <b>PURPOSE</b> <p>To provide sufficient data to enable proper installation of equipment at CCG RADAR Sites. Information provided in this DID shall be in accordance with the TSORs.</p>	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive and, with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in the Contractor's format, and shall contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Equipment Installation Data Package must include the following:</p> <p>4.3.1 <b>Equipment Identification</b>, including nomenclature, make, and model</p> <p>4.3.2 <b>Purpose of the equipment</b></p> <p>4.3.3 <b>Equipment dimensions</b>, including length, width, and height (metric)</p> <p>4.3.4 <b>Equipment weight</b> in kilograms</p> <p>4.3.5 <b>Utility specifications</b></p> <ul style="list-style-type: none"> <li>Power requirements including size and type of cabling, fusing and distribution, voltage requirements and tolerances</li> </ul> <p>4.3.6 <b>Mounting specifications and requirements</b></p> <ul style="list-style-type: none"> <li>Placement limitations between sub-systems;</li> <li>Physical description of all equipment including mounting details, clearance requirements, cable entries, etc.;</li> <li>Overhead cable support and cable ducting requirements, including interconnection cable requirements, types of cable, lengths, etc.; and</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Equipment Installation Data Package	<b>2. IDENTIFICATION NUMBER</b> TDM-03
<ul style="list-style-type: none"><li>• Equipment separation and recommended maintenance envelope.</li></ul> <p><b>4.3.7 Environmental controls (storage and operational),</b> including temperature, humidity, and dust.</p> <p><b>4.3.8 Safety provisions</b> (as applicable)</p> <ul style="list-style-type: none"><li>• Site and equipment grounding requirements</li><li>• Areas of potential danger</li><li>• Exhaust ventilation</li><li>• Fire detection and suppression</li></ul>	



## TDM-05      SYSTEM MANUALS

DATA ITEM DESCRIPTION	
1. TITLE System Manuals	2. IDENTIFICATION NUMBER TDM-05
3. PURPOSE  To provide manuals at the system level that provides an overview, performance characteristics, and operations and maintenance instructions.	
4. PREPARATION INSTRUCTIONS  4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.  4.2 The data submission may be prepared in the Contractor’s format, and shall contain sufficient detail to fully address the information requirements. The System Operations Manual and System Maintenance Manual may be included in a single publication.  4.3 The System Maintenance Manual shall be augmented with Original Equipment Manufacturer (OEM) equipment manuals.  4.4 System Operations and System Maintenance Manuals shall not be generic in nature, but be specifically written for the RADAR System.  4.5 The System Manual must include the following information: 4.5.1 GENERAL INFORMATION <ul style="list-style-type: none"><li>• About This Manual, including its purpose and structure.</li><li>• System Overview, including a description of the overall system with supporting diagrams.</li><li>• Performance Characteristics, including system capabilities and characteristics.</li></ul> 4.5.2 Provide a separate chapter for each system including: <ul style="list-style-type: none"><li>• System Description, including narrative description, system block diagram, equipment breakdown structure, and supporting data (for example, line drawings, photographs, data tables, etc.), as well as the theory of operation for the system.</li><li>• System Operation information must be provided for each piece of equipment that requires MCTS Officer</li></ul>	

DATA ITEM DESCRIPTION	
1. TITLE System Manuals	2. IDENTIFICATION NUMBER TDM-05
<p>action.</p> <ul style="list-style-type: none"> <li>Describe control layouts and menus and how the performance can be changed and optimized through the use of operator controls and the actions to be taken when an error has been detected by the System or an operator.</li> <li><b>System Maintenance information</b> must be provided for all equipment units and sub-systems and shall, <i>as a minimum</i>: <ul style="list-style-type: none"> <li>a) Include equipment-level OEM manuals with direct reference to the applicable section. Conceptually the Maintenance Manual and OEM manuals are to be used in tandem with direct references from the Maintenance Manual;</li> <li>b) Describe the theory of operation of each type of equipment to the level needed for the maintenance and troubleshooting of the equipment by technical staff;</li> <li>c) Provide functional block diagrams, mechanical drawings, and electrical schematics;</li> <li>d) Include equipment rack layouts, system interconnect diagrams, wire lists and cable layouts;</li> <li>e) Contain maintenance instructions and fault diagnostic information, including: <ul style="list-style-type: none"> <li>Fault trees and diagnostic data, including possible malfunctions, causes, effects, fault isolation techniques and solutions.</li> <li>Safety considerations.</li> <li>Disassembling, repairing/replacing sub-assemblies and re-assembling the equipment.</li> <li>Use of special tools and test equipment.</li> <li>Preventive maintenance schedules.</li> <li>Test and adjustment (including test sheets, as applicable).</li> <li>Allowable service limits, wear limits for replacement, end play limits, balance data, torque values, cleaning information, etc.</li> </ul> </li> <li>f) Include illustrated Parts List: <ul style="list-style-type: none"> <li>Line drawing of the system/equipment (schematic or exploded view), with parts assigned sequence</li> </ul> </li> </ul> </li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> System Manuals	<b>2. IDENTIFICATION NUMBER</b> TDM-05
<p>numbers to provide a link to the parts list.</p> <ul style="list-style-type: none"><li>• Indented parts list, identifying every component which may be replaced, in accordance with the planned depth of maintenance.</li></ul> <p>g) Describe how the performance of the equipment can be changed and optimized through the use of all controls and describe, in detail, the procedures for the maintenance and repair of the equipment; and</p> <p>h) Include a section in which all changes to original equipment manufacturer manuals are identified and documented.</p>	

## TDM-06 EQUIPMENT MANUALS

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Equipment Manuals	2. <b>IDENTIFICATION NUMBER</b> TDM-06
3. <b>PURPOSE</b> To provide system/equipment level operation, maintenance and repair instructions, and an illustrated parts list.	
4. <b>PREPARATION INSTRUCTIONS</b> 4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. 4.2 The data submission may be prepared in the contractor's format, and shall contain sufficient detail to fully address the information requirements. 4.3 The Original Equipment Manufacturer (OEM) Manual shall be provided in electronic PDF form (if at all possible), as well as in hard copy. 4.4 If the OEM Manual discusses several different models of equipment, then a Difference Data Sheet must be provided to help the user understand which instructions apply to the model provided to the CCG, or preferably, the OEM Manual shall be edited so that it contains only relevant data. 4.5 The OEM Manual must include the following information: <ul style="list-style-type: none"> <li>– System/Equipment Data and Description</li> <li>– Theory of Operation (supported by system block diagrams)</li> <li>– Installation Instructions (if applicable)</li> <li>– Operating Instructions</li> <li>– Maintenance Instructions <ul style="list-style-type: none"> <li>• Preventive maintenance schedules</li> <li>• Disassembling, repairing/replacing and re-assembling the equipment</li> <li>• Use of special tools and test equipment</li> <li>• Test, adjustment, check-out data (including test sheets, as applicable)</li> <li>• Allowable service limits, wear limits for replacement, end play</li> </ul> </li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Equipment Manuals	<b>2. IDENTIFICATION NUMBER</b> TDM-06
<p>limits, balance data, torque values, cleaning information, etc.</p> <ul style="list-style-type: none"><li>– Diagnostic Data<ul style="list-style-type: none"><li>• Possible malfunctions, causes, affects, fault isolation techniques and solutions, electrical schematics</li></ul></li><li>– Illustrated Parts List<ul style="list-style-type: none"><li>• Line drawing of the system/equipment (schematic or exploded view), with parts assigned sequence numbers to provide a link to the parts list</li><li>• Indented parts list, identifying every component which may be replaced (in accordance with the planned depth of maintenance)</li></ul></li></ul>	

**TDM-07 SOFTWARE VERSION DESCRIPTION DOCUMENT**

<b>DATA ITEM DESCRIPTION</b>	
<b>1. TITLE</b> Software Version Description Document	<b>2. IDENTIFICATION NUMBER</b> TDM-07
<b>3. PURPOSE</b> To describe the software installed initially and to enable the release, tracking and control of software upgrades over the asset life cycle. It also describes any site-specific variants of the software.	
<b>4. PREPARATION INSTRUCTIONS</b> <b>4.1</b> This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. <b>4.2</b> The data submission may be prepared in the contractor's format, and shall contain sufficient detail to fully address the information requirements. <b>4.3</b> The Software Version Description Document must include the following information: <b>4.3.1 IDENTIFICATION</b> <ul style="list-style-type: none"> <li>– <b>Software System Title and Version</b></li> <li>– <b>Variant ID</b> – If this is a variant (for example site specific), identify the software variant</li> <li>– <b>Release Number or Block Change</b> – Identify the software release number (or block change)</li> <li>– <b>Release Date</b></li> <li>– <b>Replaces</b> – Fully identify the software being replaced</li> </ul> <b>4.3.2 APPLICABILITY</b> – Identify the system to which the software version applies. <ul style="list-style-type: none"> <li>– <b>Applicable System</b></li> <li>– <b>Target Platform</b> – Identify the specific computing platform to which the relevant version (or block change) is applicable</li> </ul> <b>4.3.3 VERSION DESCRIPTION</b> <ul style="list-style-type: none"> <li>– <b>Inventory of Materials Released</b> – List all physical distribution media and associated documentation for the software being released. Use titles,</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Software Version Description Document	<b>2. IDENTIFICATION NUMBER</b> TDM-07
<p>identifying numbers, dates, version numbers, and release numbers, as applicable. Indicate any applicable restrictions regarding licensing, duplication, and security considerations.</p> <ul style="list-style-type: none"> <li>– <b>Inventory of Software Contents</b> – For each physical distribution medium, list the computer files contained therein. Include the file names, versions, dates, and any other pertinent information.</li> <li>– <b>Target Platform Configuration</b> – Specify the required configuration of the target platform before this software version can be installed and executed, or attach a hardware specification document.</li> <li>– <b>Adaptation Data</b> – For the initial software release, describe the site-specific data or customizations featured in this version of the software, corresponding to the target platform above. For subsequent releases, describe any changes to the site-specific data.</li> <li>– <b>Installation and Check-out Instructions</b> – Give detailed instructions on: <ul style="list-style-type: none"> <li>• How to install this software release on the target platform</li> <li>• Test procedure to ensure that the installed software is working properly</li> <li>• Point-of-contact in case difficulties are encountered with the software installation</li> <li>• Applicable security, privacy or safety precautions</li> </ul> </li> <li>– <b>Disposal Instructions</b> – If applicable, what to do with the previously released software version after this version has been successfully installed. (Include security considerations if applicable.)</li> <li>– <b>Changes Installed</b> – If applicable, describe the changes, which have been implemented in the current software version, as compared to the previous one. This may include both enhancements as well as fault fixes. This paragraph is not applicable to the initial release of software.</li> <li>– <b>Possible Problems and Known Errors</b> – Identify any possible problems or known errors in the software version including: <ul style="list-style-type: none"> <li>• How to avoid the relevant errors</li> <li>• How to recognize and recover from the consequences of the errors</li> <li>• What is being done to correct the problems permanently, and when a resolution can be expected</li> </ul> </li> <li>– <b>Related Documents</b> – List any other documents, which are applicable to</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Software Version Description Document	<b>2. IDENTIFICATION NUMBER</b> TDM-07
the software version being released, but which are physically not included in this release. Indicate the document titles, document numbers, version numbers, version dates, and publication source.	
<b>4.3.4 SUPPLEMENTARY NOTES</b> – Any additional information about the software version, which may facilitate installer or user understanding (e.g. acronyms, definitions, background information, and rationale).	

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## TDM-08 SOFTWARE USER MANUAL

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Software User Manual	2. <b>IDENTIFICATION NUMBER</b> TDM-08
3. <b>PURPOSE</b> To explain how to install computer system software and to properly operate a software-based system.	
4. <b>PREPARATION INSTRUCTIONS</b> 4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. 4.2 The data submission may be prepared in the contractor's format, and shall contain sufficient detail to fully address the information requirements. 4.3 The Software User Manual must include the following information: 4.3.1 <b>SYSTEM OVERVIEW</b> – Present a high-level overview of the system – its purpose, required hardware and software architecture. 4.3.2 <b>APPLICABLE DOCUMENTS</b> – List all applicable product support documents pertaining to the system. 4.3.3 <b>TARGET COMPUTER SYSTEM HARDWARE</b> <ul style="list-style-type: none"> <li>– <b>Hardware Overview</b> – Describe the target computer system hardware, including peripherals</li> <li>– <b>Hardware Configuration</b> – Describe how the hardware should be configured for operation. Discuss the following topics:</li> <li>– <b>Installation Requirements</b> – List the prerequisites such as physical installation space (e.g. 19" rack mount), electrical power type and capacity, air conditioning or special cooling provisions, etc.</li> <li>– <b>Environmental Considerations</b> – Discuss any environmental conditions, which must be satisfied for the system to operate properly. Some examples are: office or computer room environment only, isolation from shock and vibration.</li> <li>– <b>Nominal Configuration</b> – Describe the baseline system hardware configuration</li> <li>– <b>Special Variants</b> – Describe any site or application-specific variants in hardware configuration, which may have an impact on the system</li> </ul>	

DATA ITEM DESCRIPTION	
1. TITLE Software User Manual	2. IDENTIFICATION NUMBER TDM-08
<p>software</p> <ul style="list-style-type: none"> <li>– <b>Hardware Operating Procedures</b> – Describe how the hardware should be properly operated.</li> <li>– <b>Start-up</b> – Describe how to start up the system from a power-off state</li> <li>– <b>Normal Operation</b> – Describe all of the routine operating procedures (e.g. Swap-out of storage media, sanitization of the system after use)</li> <li>– <b>Forbidden Actions</b> – List and describe operator hardware-related actions, which can result in undesirable consequences such as computer hardware damage, loss of data, or improper operation of other equipment</li> <li>– <b>Diagnostics</b> – Describe any automatic built-in test functions and user-initiated diagnostics</li> <li>– <b>Shut-Down</b> – Describe how to properly shut down the system hardware</li> <li>– <b>Emergency Procedures</b> – Describe any applicable emergency procedures</li> </ul>	
<p><b>4.3.4 COMPUTER SYSTEM SOFTWARE</b></p> <ul style="list-style-type: none"> <li>– <b>Software Overview</b> – Describe the architecture of the computer system software and explain the purpose and functionality of all of the elements.</li> <li>– <b>Software Installation</b> – Describe how to install or reinstall the computer system software on the target computer addressing issues such as: <ul style="list-style-type: none"> <li>• Hardware prerequisites – List the baseline hardware requirements that are prerequisites for the execution of the software</li> <li>• Software prerequisites – List any dependencies of the computer system software on other software. For example: the host platform's operating system (including version), embedded firmware, software tools such as a database management system, or terminal emulator software</li> <li>• Site Adaptations – Describe any computer system hardware variants and the corresponding site adaptations of the computer system software. Describe how the software must be configured to operate at these sites</li> <li>• Installation procedure – Describe the step-by-step procedure for the initial installation or reinstallation of the computer system software</li> </ul> </li> </ul>	

DATA ITEM DESCRIPTION	
1. TITLE	2. IDENTIFICATION NUMBER
Software User Manual	TDM-08
<ul style="list-style-type: none"> <li>• Installation check-out – Describe how the user can ascertain whether the installed computer system software is operating correctly on the target hardware</li> <li>– <b>Software Operating Procedures – Describe how the software should be properly operated including:</b> <ul style="list-style-type: none"> <li>• <b>Start-up</b> – Describe how to initiate software execution</li> <li>• Normal Operation – Describe all of the routine operating procedures (e.g. system initialization, operator task sequences, data back up and recovery, etc.). Show the relevant operator-machine interactions, data entry screens, hard and soft copy reports generated, etc.</li> <li>• <b>Shut-Down</b> – Describe how to properly terminate software execution prior to powering off the computer system hardware</li> <li>• <b>Forbidden Actions</b> – List and describe operator software-related actions, which can result in undesirable consequences such as computer hardware damage, loss of data, or improper operation of other equipment</li> <li>• <b>Back up and Recovery</b> – Describe routine procedures to back-up system data, and in the event of data loss, how to recover and resume operations using the back up media</li> <li>• <b>Emergency Procedures</b> – Describe any software-related procedures, which must be performed in case of specific emergencies.</li> </ul> </li> <li>– <b>Messages</b> – List and describe the meaning of all messages generated by the system software. This includes: <ul style="list-style-type: none"> <li>• Operating status messages</li> <li>• Diagnostic messages</li> <li>• Error messages</li> </ul> </li> <li>– <b>Quick Reference Guide</b> – Provide a succinct summary of operator software commands.</li> </ul> <p><b>4.3.5 SECURITY AND PRIVACY</b> – Identify any security or information privacy issues which may exist in the system, and describe how they should be addressed during system operation. This should include such things as user log-in procedures, user privileges, and physical security.</p> <p><b>4.3.6 SUPPORT</b> – Identify sources of support available to the system users in the</p>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Software User Manual	<b>2. IDENTIFICATION NUMBER</b> TDM-08
<p>event that they experience difficulties that are beyond their capabilities. The topics may include:</p> <ul style="list-style-type: none"><li>– <b>Hardware Support</b> – Indicate how to contact extended hardware support for problems, which are beyond the capabilities of local resources</li><li>– <b>Network Support</b> – For network-based systems, indicate how to contact communications network support for problems, which are beyond the capabilities of local resources</li><li>– <b>Software Support</b> – Indicate how to contact software support for problems, which are beyond the capabilities of local resources</li><li>– <b>Reporting Problems</b> – Describe the procedure for documenting and reporting system problems, and for suggesting system enhancements</li></ul>	

## CM-01 CONFIGURATION MANAGEMENT PLAN

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Configuration Management Plan	<b>2. IDENTIFICATION NUMBER</b> CM-01
<b>3. PURPOSE</b> To describe the contractor's Configuration Management Program, which describes how the configuration baseline(s) be documented and addresses both CCG directed and contractor initiated configuration changes.	
<b>4. DATA PREPARATION INSTRUCTIONS</b> <b>4.1</b> This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. <b>4.2</b> The resulting document may be prepared in the contractor's format and shall contain sufficient detail to fully address the information requirements. <b>4.3</b> The Configuration Management Plan must include the following information: <b>4.3.1 Introduction</b> – purpose, scope, related plans, standards, definitions, acronyms <b>4.3.2 Organization and Management</b> – project CM organization, Configuration Manager, the contractor's Configuration Management Control Board <b>4.3.3 Interfaces</b> – with other disciplines/functions, especially engineering, procurement, integrated logistic support, production/construction, tests and trials, quality assurance, planning and scheduling <b>4.3.4 Flow Down of Configuration Management requirements</b> – to subcontractors and suppliers <b>4.3.5 Conduct of Configuration Management:</b> <ul style="list-style-type: none"> <li>– Configuration Identification</li> <li>– Configuration Identification Function</li> <li>– Selection of Configuration Items</li> <li>– Drawings and Parts List</li> <li>– Master Equipment List</li> <li>– System Block Diagrams</li> <li>– Baseline Management</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Configuration Management Plan	<b>2. IDENTIFICATION NUMBER</b> CM-01
<ul style="list-style-type: none"> <li>– Configuration Control</li> <li>– Configuration Control Function</li> <li>– Design Change Request Procedure</li> <li>– Drawing Revision Notice Procedure</li> <li>– Software Change Request Procedure</li> <li>– Request for Variance Procedure</li> <li>– Configuration Status Accounting (CSA)</li> <li>– Tracking Configuration Changes</li> <li>– CSA Reports</li> <li>– Configuration Audits</li> <li>– Functional Configuration Audit</li> <li>– Physical Configuration Audit</li> </ul> <p><b>4.3.6 Transfer of Configuration Data to the CCG</b></p>	

**CM-03 REQUEST FOR CLARIFICATION**

<b>DATA ITEM DESCRIPTION</b>	
<b>1. TITLE</b> Request for Clarification	<b>2. IDENTIFICATION NUMBER</b> CM-03
<b>3. PURPOSE</b> To recommend clarification in the wording of project documentation including TSOR or SOW.	
<b>4. DATA PREPARATION INSTRUCTIONS</b>  4.1 The Request for Clarification may be prepared in the Contractor's format and must contain sufficient detail to fully address the following information requirements:  4.1.1 Identification of affected document 4.1.2 Identification of affected Configuration Item 4.1.3 Existing Wording 4.1.4 Proposed Wording 4.1.5 Reason For Change 4.1.6 Record of Decision (to be completed by the CCG)	

## CM-04 CHANGE REQUEST

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Change Request	<b>2. IDENTIFICATION NUMBER</b> CM-04
<b>3. PURPOSE</b> To seek a change to the TSOR, scope of deliverables, design change or any other significant change (e.g. a schedule change that impacts the overall project), which is typically desired by the Contractor.	
<b>4. DATA PREPARATION INSTRUCTIONS</b> <p><b>4.1</b> The Change Request may be prepared in the Contractor's format.</p> <p><b>4.2</b> The data provided in the Change Request shall be adequate to establish that the contemplated change is justified, is a good technical solution to the problem being addressed, and that the risk, engineering, and logistic support implications have been adequately assessed.</p> <p><b>4.3</b> Change Requests must include the following elements as applicable:</p> <p><b>4.3.1</b> Project Title;</p> <p><b>4.3.2</b> WBS Element(s);</p> <p><b>4.3.3</b> Requested By;</p> <p><b>4.3.4</b> Date;</p> <p><b>4.3.5</b> Change Title;</p> <p><b>4.3.6</b> Description of the proposed change;</p> <p><b>4.3.7</b> Justification for the proposed change;</p> <p><b>4.3.8</b> Type of Change: Arising or New Work. Minor or Major;</p> <p><b>4.3.9</b> Change Priority: (Medium/Low/High);</p> <p><b>4.3.10</b> Cost to the CCG for the proposed change;</p> <p><b>4.3.11</b> Impact(s) to:</p> <ul style="list-style-type: none"> <li>• Project baseline;</li> <li>• TSOR;</li> <li>• System performance;</li> <li>• Schedule;</li> </ul>	



DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Change Request	<b>2. IDENTIFICATION NUMBER</b> CM-04
<ul style="list-style-type: none"> <li>• Delivered equipment, software, documentation or training;</li> <li>• Guarantees or warranties;</li> </ul> <p><b>4.3.12</b> Signature and name of the Contractor's authorized official;</p> <p><b>4.3.13</b> A block for the CCG TA to indicate recommendation or non-recommendation of the Change Request;</p> <p><b>4.3.14</b> A block for the PWGSC CA to indicate approval or disapproval of the Change Request; and</p> <p><b>4.3.15</b> Supporting data necessary to understand and evaluate the complete scope of the change and its impact.</p> <p><b>4.4</b> A block for Change Complete Certification (see note)</p> <p><b>Note:</b> If the Change Request is approved, then the Contractor must implement the change (normally on the basis of a contract amendment) and bring the technical data, Quality Management inspection requirements, test and trial requirements, and logistic support into line with the change. The Change Request form must include a section to confirm to the CCG that this has been accomplished. In addition the PMP and Master Schedule must be amended as required within five (5) days.</p>	

## SE-09 RELIABILITY DATA

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Reliability Data	2. <b>IDENTIFICATION NUMBER</b> SE-09
3. <b>PURPOSE</b> To describe the Contractor's approach to achieving TSOR requirements and ensuring adequate asset reliability and availability.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG TA, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in Contractor's format, and shall contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Reliability Data shall include the following information:</p> <p><b>4.3.1 General Guidance</b></p> <p>4.3.1.1 The reliability analysis must include all parts of the supplied system, and must be to the module level (a module can be any part of the system, including, but not limited to, a complete transceiver, an antenna system, or an LRU), showing how the System Availability and MTBF is derived.</p> <p>4.3.1.2 A detailed availability and reliability model shall be developed for the complete System including the remote site sub-systems and the Workstations.</p> <p>4.3.1.3 The model must identify critical items or paths whose failure can cause System or sub-system failure, major performance degradation, or marginal operation.</p> <p>4.3.1.4 The model must be included in the availability and reliability predictions.</p> <p>4.3.1.5 The MTBF and the MTTR for each module in the System must be presented with the analysis.</p> <p>4.3.1.6 Reliability and Maintainability Data must be provided.</p>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Reliability Data	<b>2. IDENTIFICATION NUMBER</b> SE-09
4.3.1.7 Design Implications of the CCG-provided Data. 4.3.1.8 This must include gathering and Assessment of Sub-Contractor / Supplier R&M Data.	

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## SE-10 TECHNICAL REVIEW PREPARATIONS

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Technical Review Preparations	<b>2. IDENTIFICATION NUMBER</b> SE-10
<b>3. PURPOSE</b> To plan for technical reviews, provide the technical data required for each review, and document the reviews.	
<b>4. DATA PREPARATION INSTRUCTIONS</b> <b>4.1</b> This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. <b>4.2</b> Each data submission may be prepared in contractor's format, and shall contain sufficient detail to fully address the information requirements. <b>4.3</b> The required information may be delivered progressively: <ul style="list-style-type: none"> <li>– The 'Technical Review Plan and Arrangements' is required with the first submission</li> <li>– The 'Technical Review Preparations' is required at least one month prior to each review</li> <li>– The 'Technical Review Data Package' is required at least two weeks prior to each review</li> <li>– The 'Technical Review Minutes' must be prepared during the Technical Review</li> </ul> <b>4.4</b> The Technical Review Preparations, Data and Minutes submissions must include the following information: <b>4.4.1 Technical Review Plan and Arrangements</b> <ul style="list-style-type: none"> <li>4.4.1.1 Project Phases, Baselines and Technical Reviews</li> <li>4.4.1.2 Technical Review Schedule</li> <li>4.4.1.3 Location of Each Technical Review</li> <li>4.4.1.3 Overview of Technical Review Roles and Responsibilities</li> </ul> <b>4.4.2 Technical Review Preparations</b> – provide the required information for each Technical Review <ul style="list-style-type: none"> <li>4.4.2.1 Technical Review Objective</li> </ul>	

DATA ITEM DESCRIPTION	
1. TITLE	2. IDENTIFICATION NUMBER
Technical Review Preparations	SE-10
<p>4.4.2.2 Technical Review Pre-requisites – what work must have been accomplished prior to the review</p> <p>4.4.2.3 Technical Documents to be Reviewed – list of documents and whether outline, draft or final</p> <p>4.4.2.4 Organizations and Individuals Involved in the Review – and their specific review responsibilities</p> <p>4.4.2.5 Detailed Arrangements – transportation, accommodation, conference room booking, equipment displays, access to work site</p> <p><b>4.4.3 Technical Review Data Package</b></p> <p>4.4.3.1 Status of Action Items from Previous Reviews – applicable from the 2<sup>nd</sup> review onwards</p> <p>4.4.3.2 Presentation Material – including status of primary technical objectives</p> <p>4.4.3.3 Configuration Status – list of active Design Change Requests, Drawing Revision Notices and Requests for Variance</p> <p>4.4.3.4 Technical Documentation – a copy of each document (not previously delivered) needed to show that the objectives of the completed phase of work have been accomplished</p> <p><b>4.4.4 Technical Review Minutes</b></p> <p><i>Note: The minutes shall be prepared by the Contractor, signed by both the Contractor and the CCG Technical Authority, and provided to participants at the conclusion of the Technical Review</i></p> <p>4.4.4.1 Technical Review Conclusions</p> <p>4.4.4.2 Action Items – and assigned responsibility and due date</p> <p>4.4.4.3 Technical Review Status – acceptance, conditional acceptance, rejection</p>	

## SE-11 INTERFACE SPECIFICATION

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Interface Specification	<b>2. IDENTIFICATION NUMBER</b> SE-11
<b>3. PURPOSE</b> To precisely define and control the interface between the asset being acquired and other CCG systems or equipment.	
<b>4. DATA PREPARATION INSTRUCTIONS</b> <b>4.1</b> This DID is not meant to be restrictive, and with prior written agreement from the CCG Technical Authority (TA) named in the Contract, may be tailored by the contractor. <b>4.2</b> Each data submission may be prepared in contractor's format, and shall contain sufficient detail to fully address the information requirements. <b>4.3</b> The Interface Specification, and each update of it, must be agreed upon by the technical person responsible for each side of the interface. <b>4.4</b> The Interface Specification must include the following types information, with the data provided being suitable for the technology involved and the particular interface. <i>Note: The following list is indicative. Select appropriate topics; add topics to the list that are needed to define the particular interface.</i> <ul style="list-style-type: none"> <li>– System / equipment identification</li> <li>– Size and shape limitations</li> <li>– Installation mounting details</li> <li>– Installation and wiring drawings</li> <li>– Maximum weight allocation</li> <li>– Movement restrictions</li> <li>– Space requirements, including access space for maintenance</li> <li>– Flow of signals across the boundary</li> <li>– Software to hardware interface</li> <li>– Software to software interface</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Interface Specification	<b>2. IDENTIFICATION NUMBER</b> SE-11
<ul style="list-style-type: none"><li>– Power type, source and consumption rate</li><li>– Need for regulated power; uninterrupted power</li><li>– Heating requirements</li><li>– Heat dissipation and cooling requirements</li><li>– Electromagnetic compatibility concerns</li><li>– Contact of dissimilar metals</li><li>– Safety and health considerations</li></ul>	

## TE-02 TEST PLAN AND REPORT

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Test Plan and Report	2. <b>IDENTIFICATION NUMBER</b> TE-02
3. <b>PURPOSE</b> To provide a plan for system testing.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in Contractor's format, and must contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Test Plan must include, but not be limited to, the following information:</p> <p style="margin-left: 40px;">4.3.1 <b>Introduction</b>, including purpose, scope, references, definitions, and acronyms.</p> <p style="margin-left: 40px;">4.3.2 <b>Organization and Management</b></p> <p style="margin-left: 80px;">4.3.2.1 Organization, including key personnel.</p> <p style="margin-left: 80px;">4.3.2.2 Terms of Reference, including responsibilities for preparation, internal/external test permissions, development of acceptance tests, conduct of the tests, witnessing, report preparation, and results follow-up.</p> <p style="margin-left: 80px;">4.3.2.3 Methodology for the equipment and system level FATs, IIT, and SATs.</p> <p style="margin-left: 40px;">4.3.3 <b>Test Report</b></p> <p style="margin-left: 80px;">4.3.3.1 The report must include a complete overview of the results covering <i>as a minimum</i>:</p> <p style="margin-left: 80px;">4.3.3.2 Problems Encountered, including problems and action taken</p> <p style="margin-left: 80px;">4.3.3.3 Test Results, including details of all of the test data and summary of the data reduction and analysis. Reference</p>	



DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Test Plan and Report	<b>2. IDENTIFICATION NUMBER</b> TE-02
<p>in this section can be made to the attached annexes (which shall include TE-03).</p> <p>4.3.3.4 Conclusions, including:</p> <ul style="list-style-type: none"><li>• Identify the pass/fail result and provide a brief analysis of the test results in narrative form; and</li><li>• Identify the action plan to resolve any outstanding issues.</li></ul>	

## TE-03 ACCEPTANCE TEST PROCEDURES

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Acceptance Test Procedures	2. <b>IDENTIFICATION NUMBER</b> TE-03
3. <b>PURPOSE</b> To provide the procedures to be followed for the Factory Acceptance Test, INNAV Interface Test, and Site Acceptance Tests.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> <p>4.1 This DID is not meant to be restrictive and, with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in Contractor's format, and shall contain sufficient detail to fully address the information requirements. The Tests shall capture all requirements in the TSORs, SOR and SOW, and shall provide the appropriate contract reference (see example Test Sheet below)</p> <p>4.3 The Test Procedure must include the following information as applicable:</p> <p style="margin-left: 40px;">4.3.1 <b>Test Purpose</b></p> <ul style="list-style-type: none"> <li>• Asset / item to be tested</li> <li>• Test objective</li> <li>• Test witnessing</li> <li>• Schedule of Events</li> </ul> <p style="margin-left: 40px;">4.3.2 <b>Testing Conditions</b></p> <ul style="list-style-type: none"> <li>• Test Facility</li> <li>• Environmental Conditions</li> <li>• Test Equipment, Recording Equipment</li> <li>• Set-up, Calibration, Pre-test Checks</li> <li>• Operating Conditions of Test Item</li> <li>• Safety Precautions and Warnings</li> </ul> <p style="margin-left: 40px;">4.3.3 <b>Test Procedure</b></p> <ul style="list-style-type: none"> <li>• Description of requirement to be tested;</li> <li>• Reference to the section(s) in TSORs, SOW and/or other applicable documents;</li> </ul>	

DATA ITEM DESCRIPTION	
<b>1. TITLE</b> Acceptance Test Procedures	<b>2. IDENTIFICATION NUMBER</b> TE-03
<ul style="list-style-type: none"><li>• Test Configuration;</li><li>• Test method to be used to test the requirement;</li><li>• Expected result;</li><li>• Obtained result; and</li><li>• Pass/Fail Condition(s).</li></ul> <p><b>4.3.4 Recording and Reporting</b></p> <ul style="list-style-type: none"><li>• Format for Recording Test Results (see example Test Sheet below)</li><li>• Data Collection and Analysis</li><li>• Quality Assurance Certification</li></ul> <p><b>4.3.5 Signature of Participating Organizations on Test Results</b></p>	

### TE-03 Example Test Sheet

Test #	Ref	Aim/Description	VM	Procedure/Pass-Fail Criteria	Result	Init
1	T 3.1.6.2.1	All the transmitters must be configured such that in the event of a failure of any one transmitter, the standby transmitter can take the place of the failed unit.	D	Step: Two transmitters transmitting, introduce fault into one  Expected result: the warm-standby transmitter is immediately available	P/F	
<b>Test Completion Signatures</b>						
<b>CCG Signatory</b>			<b>Contractor Engineering Signatory</b>			
Name:			Name:			
Signature:			Signature:			
Date:			Date:			

Verification Method (VM): I – Inspection, D – Demonstration, A – Analysis, T – Test

Reference: T – TSOR, S – Statement of Work

Results: P – Pass, F – Fail

## MM-04 MAINTENANCE PLANS

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Maintenance Plans	2. <b>IDENTIFICATION NUMBER</b> MM-04
3. <b>PURPOSE</b> <p>To provide a complete set of maintenance plans that identify the required maintenance tasks, indicate organizational responsibility for the tasks, and identify the logistics support resources needed to perform the tasks.</p>	
4. <b>DATA PREPARATION INSTRUCTIONS</b> 4.1 The data submission may be prepared in contractor's format, and shall contain sufficient detail to fully address the information requirements. 4.2 The submission must include a maintenance plan for each system/equipment. These shall be consolidated into one document. 4.3 <b>Asset Breakdown Structure</b> – The Maintenance Plan must include the Asset Breakdown Structure (in a separate section), which may be used to index/number the individual maintenance task data sheets. 4.4 <b>Technical Data</b> – It must also include a section listing all manuals, drawings, regulations and other technical data used in the development of the maintenance plans. 4.5 <b>Maintenance Tasks</b> – The Maintenance Plan must include a section presenting maintenance task data sheets that contain the following information for each maintenance task: <ul style="list-style-type: none"> <li>– Task identification</li> <li>– Task organizational responsibility</li> <li>– Task origin</li> <li>– Task interval or frequency</li> <li>– Reference technical documents</li> <li>– Task precautions and comments</li> <li>– Instructions in manuals (if applicable)</li> <li>– Safety considerations</li> <li>– Job plan steps</li> </ul>	

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Maintenance Plans	2. <b>IDENTIFICATION NUMBER</b> MM-04
<ul style="list-style-type: none"> <li>– Work allocation – occupations and estimated hours</li> <li>– Material Safety Data Sheet – if any applicable to task</li> <li>– Required maintenance resources – material, parts, tools and test equipment</li> </ul>	
4.6	<p><b>Parts Summary</b> – The required spares and repair parts needed for each task shall be aggregated and rationalized and presented in a Parts Summary Report. This report shall relate the parts requirements to the equipment and maintenance task(s) being supported.</p>
4.7	<p><b>Material Summary</b> – The required material (lubricants, glues, paints, etc.) needed for each task shall be aggregated and rationalized and presented in a Material Summary Report. This report shall relate the material requirements to the equipment and maintenance task(s) being supported.</p>
4.8	<p><b>Tools and Test Equipment Summary</b> – The required tools and test equipment needed for each task must be aggregated and rationalized and presented in a Parts Summary Report. This report must relate the tools and test equipment to the equipment and maintenance task(s) being supported.</p>

## MM-05 PREVENTIVE MAINTENANCE PROGRAM

DATA ITEM DESCRIPTION									
1. <b>TITLE</b> Preventive Maintenance Program	2. <b>IDENTIFICATION NUMBER</b> MM-05								
3. <b>PURPOSE</b> To provide a complete list of preventive maintenance tasks organized in various ways that may be helpful during the in-service phase in scheduling the work.									
4. <b>DATA PREPARATION INSTRUCTIONS</b> 4.1 The data submission may be prepared in contractor's format, and must contain sufficient detail to fully address the information requirements 4.2 The submission must identify the required preventive maintenance for each system/equipment. The data must be consolidated into one document. 4.3 The timing of the preventive maintenance tasks must be as expressed in the maintenance plans. 4.4 The data must be grouped into tables listing routine, calendar based and operating hour based tasks. An example breakout is shown below. Each interval within a category will be a column in its respective table. <table border="1"> <thead> <tr> <th>Scheduled Task</th><th>Interval</th></tr> </thead> <tbody> <tr> <td>Routine Technologist Tasks</td><td>Daily or Weekly</td></tr> <tr> <td>Monthly Preventive Maintenance Tasks</td><td>e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months</td></tr> <tr> <td>Usage-Based Preventive Maintenance Tasks</td><td>e.g. 100, 200, 250, 400, 500, 800, 1000, 2000, 3000, 4000, 5000 or 6000 hours</td></tr> </tbody> </table>		Scheduled Task	Interval	Routine Technologist Tasks	Daily or Weekly	Monthly Preventive Maintenance Tasks	e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months	Usage-Based Preventive Maintenance Tasks	e.g. 100, 200, 250, 400, 500, 800, 1000, 2000, 3000, 4000, 5000 or 6000 hours
Scheduled Task	Interval								
Routine Technologist Tasks	Daily or Weekly								
Monthly Preventive Maintenance Tasks	e.g. 1, 3, 4, 6, 12, 18, 24, 36, 48 or 60 months								
Usage-Based Preventive Maintenance Tasks	e.g. 100, 200, 250, 400, 500, 800, 1000, 2000, 3000, 4000, 5000 or 6000 hours								
4.5 The data must also be organized by the Asset Structure, so that the required preventive maintenance for any system/equipment can be easily determined.									

## MM-06 CALIBRATION REQUIREMENTS REPORT

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Calibration Requirements Report	2. <b>IDENTIFICATION NUMBER</b> MM-06
3. <b>PURPOSE</b> To identify special tools and test equipment that require calibration and to specify the calibration requirement.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> 4.1 The data submission may be prepared in contractor's format, and shall contain sufficient detail to fully address the information requirements 4.2 The Calibration Requirements Report must provide the following information for each item requiring calibration. <ul style="list-style-type: none"> <li>– Item Sequence Number</li> <li>– Item Description</li> <li>– Manufacturer</li> <li>– Manufacturer's Part Number</li> <li>– CAGE Code (Manufacturer) – see 4.3</li> <li>– Calibration Interval (months)</li> <li>– Calibration Procedure (attach if necessary)</li> <li>– Calibration Standard (the standard against which the item must be calibrated)</li> </ul> 4.3 <b>Company Contact Data</b> – If the plant where the item is made does not have a CAGE code, then provide the company address, telephone number and email address in a separate Manufacturer Contact Data list.  <i>Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM</i>	



## TT-02 TRAINING DEVICES REQUIREMENTS LIST

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Training Devices Requirements List	2. <b>IDENTIFICATION NUMBER</b> TT-02
3. <b>PURPOSE</b> To provide a list of training devices needed to conduct training.	
4. <b>DATA PREPARATION INSTRUCTIONS</b> 4.1 The data submission may be prepared in contractor's format, and shall contain sufficient detail to fully address the information requirements. 4.2 A separate Training Devices Requirements List (TDRL) must be prepared for each course. 4.3 <b>Item Data</b> – The TDRL must provide the following data for each recommended item: <ul style="list-style-type: none"> <li>– Item Sequence Number</li> <li>– Item Description</li> <li>– Manufacturer</li> <li>– Manufacturer's Part Number</li> <li>– CAGE Code (Manufacturer) – see 4.4</li> <li>– NATO Stock Number (if assigned)</li> <li>– Local Commercial Purchase (Y/N) – see 4.5</li> <li>– Unit Price – see 4.6</li> <li>– Recommended Buy Quantity</li> </ul> 4.4 <b>Manufacturer Contact Data</b> – If the plant where the item is made does not have a CAGE code, then provide the manufacturer's address, telephone number and e-mail address in an associated Manufacturer Contact Data list. <i>Note: The CAGE Code is known by several acronyms: CAGE, NCAGE, FSCM, NSCM.</i> 4.5 <b>Local Commercial Purchase</b> – If the item is best obtained through Local Commercial Purchase then indicate yes (Y) in the indicated data field, and leave the Manufacturer and CAGE Code fields blank. 4.6 <b>Unit Price</b> – is the price in effect when the TDRL was submitted, consistent with the Recommended Buy Quantity. This data will be used for budgeting and	

inventory management purposes. It is understood that a future price quote for the item will reflect circumstances at the time.

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## TT-03 TRAINING MANUALS

DATA ITEM DESCRIPTION	
1. <b>TITLE</b> Training Manuals	2. <b>IDENTIFICATION NUMBER</b> TT-03
3. <b>PURPOSE</b> To provide manuals to be used in training the CCG personnel.	
<p>4. <b>PREPARATION INSTRUCTIONS</b></p> <p>4.1 This DID is not meant to be restrictive, and with prior written agreement from the CCG TA named in the Contract, may be tailored by the Contractor.</p> <p>4.2 The data submission may be prepared in the Contractor's format, and must contain sufficient detail to fully address the information requirements.</p> <p>4.3 The Technical Student Manual must, <i>as a minimum</i>, include the following information:</p> <ul style="list-style-type: none"> <li>i) Theory of operation of overall system and all sub-systems;</li> <li>j) Installation of the system;</li> <li>k) Fault locating and diagnostic techniques, both remotely and locally, using fault trees, built-in testing features and/or the use of external test and measurement equipment;</li> <li>l) Removal and replacement any LRUs with relevant spares;</li> <li>m) Complete assembly and disassembly procedures applicable to level of maintenance, including any adjustments or set-up procedures required to establish full operational performance of the equipment;</li> <li>n) Optimization of the RADAR System, including remote RADAR site optimization;</li> <li>o) Remote provisioning, monitoring, technical parameter performance checks and reports, version updates, resets;</li> <li>p) All Preventive/Periodic Maintenance routines, such as cleaning, health testing or component replacement such as filters or batteries;</li> <li>q) Procedures to back-up and restore the RADAR Equipment software using external non-volatile storage media, including saved presets and configuration data; and</li> <li>r) Procedures to load and configure new updates to the RADAR Equipment software and firmware.</li> </ul> <p>4.4 The Operational Student Manual must, <i>as a minimum</i>, include the</p>	

following information:

- s) The purpose, functions and capabilities of each device and sub-system comprising the overall system;
- t) The ability to demonstrate the correct operation of each system function;
- u) The ability to recognize equipment faults and take appropriate action to protect the equipment involved and to reconfigure remaining equipment to minimize the effect on overall System availability; and
- v) A quick reference fault finding check list shall be provided as part of the training package.

**4.4.1** The operational controls and functions which should be emphasized in the course include the Workstation display, menus, graphics, controls, alarms, as well as information logging, storage, retrieval, processing and printing.

**4.5 Training Documentation:** A standardized approach for the development of key training documentation to support formal technical training is essential to ensure effective and efficient Technical Training Management. Key documents required to conduct formal training are outlined below.

**4.5.1 Training Objectives:** set tasks in context and describe learning outcomes in observable and measurable terms. It is a behavioural statement of the task to be performed in the operational environment, the standard or performance desired, and the constraints or conditions under which the student is expected to complete the activity. Each training objective should include the following components:

- w) The skill or activity to be learned;
- x) The constraints or conditions under which the learner is expected to complete the activity;
- y) The standard or performance desired; and
- z) Related references.

**4.5.1.1** Training Objectives are further broken down into terminal and enabling objectives:

- aa) **Terminal Objectives**, the action, knowledge, or skills the learner is expected to have acquired at the end of instruction;
- b) **Enabling Objectives**, the experiences, ways and means of achieving the Terminal Objective.

**4.5.2 Course Syllabus:** an outline or summary of the details of a course for students including training objectives, target and enabling objectives, course duration, language of training, course schedule, classroom facilities, course material and student evaluation. A course syllabus should be divided into three parts:

**4.5.2.1 Task Analysis.** A list of all duties and tasks that make up the training requirement.

**4.5.2.2 Course Information,** including the following:

- c) General information;
- d) Scope of training;
- e) Course management;
- f) Prerequisites;
- g) Student evaluations;
- h) Course reports; and
- i) Training objectives.

**4.5.2.3 Course Training Plan,** identifying the following for each terminal objective:

- j) Enabling objective;
- k) Level of learning – knowledge and skill;
- l) Time required for each enabling objective;
- m) Points to be covered for each enabling objective;
- n) Type of training – knowledge or skill;
- o) Required training aids and references; and
- p) Evaluation process.

**4.5.3 Lesson Plans:** the development and use of a lesson plan will assist the instructor in providing an effective learning experience. The lesson plan ensures that the instructor follows a specific, training objective plan. Each lesson shall begin on a new page and follow the same format:

- q) Lesson number and title;
- r) Date prepared;
- s) Total training time;
- t) Methodology;
- u) Terminal and enabling objectives;
- v) Relevance;
- w) Aim;

- x) Lesson content;
- y) Equipment and training aids; and
- z) References.

**4.5.4 Training Aids:** provide a list of all training equipment that must be supplied to support the training, including reference material, training simulators, training systems or test equipment. These aids also include the installation, maintenance, and training plan for the equipment. Training aids and equipment for the entire course (and where they can be found) are the following:

- aa) Projectors;
- bb) Videos;
- cc) Block diagrams;
- dd) Flipcharts;
- ee) Whiteboards;
- ff) Simulators;
- gg) Tools;
- hh) Computers;
- ii) Test equipment; and
- jj) Laboratory or workshop equipment

**4.5.5 Instructor Manual:** provides the instructor all the information required to teach the course, including general course information, lesson plans, a description of training aids, a student manual and an evaluation guide. The Instructor Manual should include the following sections:

**4.5.5.1 General Information:**

- kk) Title;
- ll) Description;
- mm) Duration;
- nn) Target group;
- oo) Number of students;
- pp) Prerequisite knowledge;
- qq) Instructor requirements;
- rr) Course location;
- ss) Student evaluations; and
- tt) Course reporting.

**4.5.5.2 Master Lesson Plans** divided into a series of lessons, each

of which begin on a new page and follow the same format:

uu) Lesson number, title and date prepared;

vv) Total training time;

ww) Methodology;

xx) Terminal and enabling objectives;

yy) Relevance;

zz) Aim;

aaa) Lesson content;

bbb) Equipment and training aids; and

ccc) References.

**4.5.6 Student Manual:** provides the student with all the information required for the course, including general course information, lesson plans, and evaluation guides. The student manual include the following sections:

**4.5.6.1 Administration**

ddd) Course information;

eee) Course timetable;

fff) Course materials; and

ggg) Course objectives.

**4.5.6.2 Equipment safety procedures**

**4.5.6.3 Lesson Plans (same format as instructor manual)**

**4.5.6.5 References**

**4.5.7 Evaluation Guide:** explains the testing process used for the course. The evaluation guide contain the evaluation methodology and the tests and evaluations for the course, including:

hhh) Blank student copy; and

iii) Instructor's copy with the correct answers.

## **APPENDIX E NATIONAL SPARES MANAGEMENT STRATEGY**

### **E.1 INTRODUCTION**

E.1.1 The purpose of this appendix is to describe the National Spares Management (NSM) Strategy aimed at improving:

- life-cycle management of national spares in support of operations;
- visibility of national spares across the CCG;
- inventory management of spares and;
- CCG's return on investment (ROI).

E.1.2 When fully implemented NSM will provide the ability to locate and account for designated national spares throughout their life cycle and provide visibility in the Maximo application (system of record) of CCG's Asset Management System (AMS). This should lead to a reduction of equipment downtime by providing the technical community a consistent method of identifying available inventory of spares across the organization enabling them to get the right spares to the right place when required.

### **E.2 OBJECTIVE**

E.2.1 The objectives of this strategy are to:

- Identify, define and validate the business elements required for the effective and efficient management of national spares to ensure that assets are available, reliable and cost-effectively supported throughout their life cycle.
- Ensure that costs associated with acquiring, distributing, transporting, storing, maintaining, and disposing of national spares are properly processed and accurately recorded in the AMS (Maximo).
- Reduce complexity and variability of supply chain business transactions by adopting standardized transaction and business rules.
- Integrate where possible maintenance and materiel planning leading to a reduction of obsolete and duplicate spares.
- Ensure that business processes are properly defined and documented and that roles and responsibilities related to national spares management are well understood.

### **E.3 SCOPE**

E.3.1 National spares management shall apply to shore-based spares described as "rotating assets" in CCG's AMS (Maximo). These types of assets can be tracked individually by asset number or serial number or both.

E.3.2 All other spares including repair parts and consumables that do not meet the criteria



for national spares management shall continue to be managed in accordance with current inventory management practices.

E.3.3 In either situation the Technical Community is responsible for managing materiel used in support of maintenance activities. Materiel shall be properly identified, managed and tracked in CCG's AMS (Maximo).

E.3.4 In addition, the CCG is required as are all Government of Canada (GOC) departments to manage materiel in accordance with GOC Treasury Board's Policy on Management of Materiel and its associated Directives, including any related DFO policies or directives.

## **E.4 IDENTIFICATION OF NATIONAL SPARES**

E.4.1 Some factors that should be considered in defining and managing national spares are:

- Identify, define and validate the business elements required for the effective and efficient management of national spares to ensure that assets are available, reliable and cost-effectively supported throughout their life cycle
- program risk (level of service)
- system criticality (unsafe condition, personal risk to safety etc..)
- failure rate (frequency)
- value / cost (investment)
- availability of spares (lead time)
- end of life (obsolescence)
- storage location(s) (positioning and ease of access)

## **E.5 EXPECTED OUTCOMES**

- LCM's should have timely and accurate access to national spares data (current and historical) for analysis and decision making.
- The technical community should have real time visibility of national spares that are in service, in storage, under repair, in transit or on order including cost, quantity, location, condition and warranty details.
- Reliable and accurate item master and company master data.

## APPENDIX F SUPPLY PLAN

### F.1 PACKAGING AND PRESERVATION

F.1.1 All spares and repair parts supplied by Contractor shall be packaged and clearly marked and identified with manufacturer's name, item name and description, and part number on the package. Spare parts required for specific equipment or assemblies shall be kitted, separately packaged, and identified accordingly.

F.1.2 The Contractor shall be responsible (if applicable) for proper preservation and packaging of the parts for long-term storage by ensuring they are coated with an approved preservative and sealed in an approved wrapping or pack as determined by the equipment or item manufacturer. Suitable boxes may be used to package an item in accordance with standard commercial practice; however, if a box is used, each one shall contain a non-fading content list that shall be protected against damage and staining. Spare parts weighing in excess of 20 kgs shall be packed in wooden crates with lifting handles.

F.1.3 In determining packaging the Contractor shall take into consideration the nature of the item, known logistics requirements, and quantity. The selection of packaging materials shall include consideration of disposability, reuse, recycling, and conservation. The Contractor shall also outline all special storage requirements, conditions and maintenance that may apply to spares and repair parts while in storage.

F.1.4 The Contractor shall provide reusable packaging containers for materiel that shall be routinely returned for rebuilding or servicing.

F.1.5 The Contractor shall package and mark hazardous materials in accordance with applicable Federal, Provincial and international regulations.

F.1.6 The Contractor shall provide packaging that is designed to withstand logistics conditions and is of quality to ensure the protection and preservation for the safe delivery of the item to its destination. Safe delivery shall be deemed to mean no damage to the contents of the package.

F.1.7 The Contractor shall provide a Packing List that clearly identifies the contents of each shipment including the applicable Contract or Purchase Order number.

### F.2 CATALOGING AND PROVISIONING DATA

F.2.1 All information associated with the RSPL, Special Tools and Test Equipment List (STTEL) and Recommended Material List (RML) shall be submitted and formatted in accordance with the Cataloguing & Provisioning Data Template (EKME # 3303118) which complies with the Item Master requirements of CCG's Asset Management System (Maximo). The corresponding Cataloguing & Provisioning Data Template field headers are described as follows:

New Assets and Materiel - Cataloguing & Provisioning Data Template

- **Recommended Spares (RSPL)**
  - o CATALOGUING / MATERIEL IDENTIFICATION DATA

- Unique Line Item
  - NATO Stock Number (13 Digit)
  - MFG. Name
  - MFG. Part Number
  - MFG. Model Number
  - MFG. Part Name (Short Description)
  - MFG. Part Name (Long Description)
  - OnLine Manual Weblink
  - Authorized Vendor(s)
  - Vendor Part Reference Number
  - Repairable / Rotating Item (yes / no)
- PROVISIONING DATA
  - Asset (equipment) Breakdown Structure Code
  - Source, Maintenance & Recoverability Code (if applicable)
  - Unit Weight (kg)
  - Size (L,W,H in mm)
  - Fitted Quantity (number installed)
  - Anticipated Demands Per Year
  - Lead Time
  - Unit of Purchase
  - Price Per Unit of Purchase
  - Recommended Quantity - On Board
  - Recommended Quantity - Shore Based
  - Recommended Buy Quantity
- CCG INTERNAL USE
  - Provisioning Decision
  - Spares Mgmt (national / regional)
  - Maximo Item Number
  - Next Higher Assembly (if applicable)
- **Recommended Materiel (Consumables & Parts) (RML)**
  - CATALOGUING / MATERIEL IDENTIFICATION DATA
    - Unique Line Item
    - NATO Stock Number (13 Digit)
    - MFG. Name
    - MFG. Part Number
    - MFG. Model Number
    - MFG. Part Name (Short Description)
    - MFG. Part Name (Long Description)
    - OnLine Manual Weblink
    - Authorized Vendor(s)
    - Vendor Part Reference Number
  - PROVISIONING DATA
    - Unit Weight (kg)
    - Size (L,W, H in mm)
    - Shelf Life (in months) If Applicable

- Storage Characteristic Handling Code
  - Hazardous Material / Dangerous Goods Code
  - MSDS Required
  - Anticipated Demands Per Year
  - Lifetime Buy (of items facing obsolescence)
  - Lead Time
  - Unit of Purchase
  - Price Per Unit of Purchase
  - Recommended Quantity - On Board
  - Recommended Quantity - Shore Based
  - Recommended Buy Quantity
- CCG INTERNAL USE
  - Provisioning Decision
  - Spares Mgmt (national / regional)
  - Maximo Item Number
  - Next Higher Assembly (if applicable)
- **Recommended Special Tools & Test Equipment (STTEL)**
  - CATALOGUING / MATERIEL IDENTIFICATION DATA
    - Unique Line Item
    - NATO Stock Number (13 Digit)
    - MFG. Name
    - MFG. Part Number
    - MFG. Model Number
    - MFG. Part Name (Short Description)
    - MFG. Part Name (Long Description)
    - OnLine Manual Weblink
    - Authorized Vendor(s)
    - Vendor Part Reference Number
  - PROVISIONING DATA
    - Unit Weight (kg)
    - Size (L,W,H in mm)
    - Calibration Required Yes / No
    - Recommended Quantity - On Board
    - Recommended Quantity - Shore Based
    - Unit Price
    - Recommended Buy Quantity
  - CCG INTERNAL USE
    - Provisioning Decision
    - Maximo Item Number
- **Manufacturer Information**
  - This section to be completed by Contractor
    - Match to RSPL Unique Line Item
    - Manufacturer Name
    - CAGE Code

- Address
    - Website
    - Phone
    - Fax
    - Email
  - To be completed by MICOE
    - Maximo Mfg #
- **Vendor Information**
- This section to be completed by Contractor
    - Match to RSPL Unique Line Item
    - Vendor Name
    - CAGE Code
    - Address
    - Website
    - Phone
    - Fax
    - Email
  - To be completed by MICOE
    - Maximo Mfg #

### **F.3 RECOMMENDED SPARE PARTS LIST (RSPL)**

F.3.1 The Contractor must prepare and submit to CCG a Recommended Spare Parts List (RSPL) in accordance with requirements identified in the maintenance plans and rationalized to indicate appropriate quantities.

### **F.4 SPECIAL TOOLS AND TEST EQUIPMENT LIST (STTEL)**

F.4.1 The Contractor must prepare and submit to Canada a Recommended Special Tools and Test Equipment List (STTEL) in accordance with requirements identified in the maintenance plans and rationalized to indicate appropriate quantities.

### **F.5 RECOMMENDED MATERIAL LIST (RML)**

F.5.1 The Contractor must prepare and submit to Canada a Recommended Material List of consumable and bulk materiel in accordance with requirements identified in the maintenance plans. The RML must be rationalized to indicate appropriate quantities required to support the system for 20 years.



Fisheries and Oceans  
Canada

Pêches et Océans  
Canada

EKME# 3614054

Canadian  
Coast Guard

Garde côtière  
canadienne

## ***RADAR Transceiver and Antenna***



***Canadian Coast Guard***

***Technical Statement of Requirements***

F7048-160039

EKME# 3614054 v6

RADAR Transceiver and Antenna Technical Statement  
of Requirements

Revised - January 2019

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# 1 DOCUMENT MANAGEMENT

## 1.1 AUTHORITY

- 1.1.1 This document is issued by the Director General, Integrated Technical Services (ITS), Canadian Coast Guard (CCG) National Technical Authority under the authority of the Deputy Minister Fisheries and Oceans and the Commissioner of the CCG, hereinafter known as “Canada”.

## 1.2 RESPONSIBILITY

- 1.2.1 The Technical Authority (TA) for the National RADAR Replacement Project, who resides in Electronics and Informatics (E&I) is responsible for:
- creation and promulgation of the document; and
  - identification of an Office of Primary Interest (OPI) who is responsible for the coordination and the content of the document.
- 1.2.2 The OPI is responsible for:
- validity and accuracy of the content;
  - availability of this information;
  - updates as needed;
  - periodic revision; and
  - follow-up of all requests, comments and/or suggestions received to the originator.

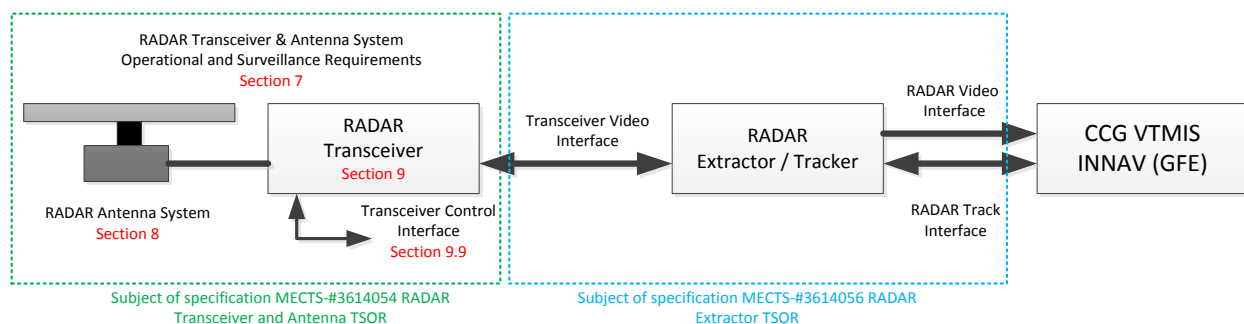
# 2 FOREWORD

## 2.1 PURPOSE

- 2.1.1 This document describes the technical requirements that must be met as a fundamental part of the normal procurement process. The contents of this specification, when included by reference in any contract, shall govern the acceptance of the system, through demonstration of the specification elements in performance tests.

## 2.2 SCOPE

- 2.2.1 This Technical Statement of Requirements (TSOR) establishes the technical requirements for the RADAR Transceiver and Antenna. The high-level diagram below illustrates how the CCG RADAR TSORs are related to the major components being replaced or acquired in the RADAR procurement project and which section refers to the identified component.



## 3 INTRODUCTION

### 3.1 REQUIREMENTS

- 3.1.1 The CCG has a requirement to procure new and replacement RADAR Equipment (Antenna System, Transceiver, Remote Control facility, Maintenance Display, and Extractor/Tracker) at its Marine Communications and Traffic Services (MCTS) RADAR sites and centres.
- 3.1.2 The requirement is for RADAR equipment consisting of the following components:
- 3.1.2.1 Antenna Systems (which include: antenna, turning unit, dual azimuth encoders, 3-phase motor, motor controller and/or inverter, and active dehydrator where required) or Fixed Panel Array Systems;
  - 3.1.2.2 RADAR Transceivers Equipment (which includes: dual Solid-State X-Band RADAR transceivers, waveguide switches and dummy loads); and
  - 3.1.2.3 RADAR Extractor/Trackers.
- 3.1.3 Site specific RADAR equipment configurations must be supplied except in cases where existing components are retained; in which case, the RADAR Transceiver and Antenna to be supplied must be required to interface with certain retained components.
- 3.1.4 This specification defines the essential characteristics and performances that are required for the new RADAR equipment, in particular, the RADAR Transceivers and Antenna Systems. The detailed technical specification for the RADAR Extractor/Tracker is contained in a separate document EKME# 3614056.

### 3.2 EXISTING RADAR TRANSCEIVERS AND ANTENNA SYSTEMS AND LOCATIONS

- 3.2.1 The existing RADAR Transceivers and Antenna Systems are a mix of makes and models. The majority of the RADAR transceivers are 25 kW units, with five (5) being 50 kW

units. All legacy RADAR transceivers are pulse-type, magnetron based, some installed between 1989 and 2005.

- 3.2.2 As identified in Table 3-1, five Antenna systems have not reached their end-of-life and are not required to be changed by the Contractor. The Contractor may choose to retain or replace these antenna systems. If the Contractor chooses to replace these antenna systems the Contractor must include the replacement equipment within the proposed site configurations.
- 3.2.3 New and if elected by the Contractor, retention of existing Antenna Systems as identified in *italics and bold*, antenna systems 12 – 16, in Table 3-1, which may include slotted waveguide antennas, parabolic reflector-type antennas and turning units, or Fixed Panel Arrays, must be used with the new Transceivers.
- 3.2.4 All existing RADAR transceivers that are due for replacement are non-coherent, pulse type, and magnetron based. This specification is for all solid-state coherent RADARs with advanced receiver signal processing (e.g., Doppler processing and frequency diversity).

### 3.3 SUMMARY OF EXISTING RADAR TRANSCEIVERS AND ANTENNA SYSTEMS, AND LOCATIONS

3.3.1 The CCG currently operates the following RADAR systems:

- 3.3.1.1 23 operational RADAR sites requiring replacement, and
- 3.3.1.2 One (1) RADAR at the Coast Guard College.

3.3.2 All existing RADAR transceivers and the majority of Antenna Systems (as noted in Table 3-1) must be replaced with new equipment. Items in *italics and bold* have not reached their end-of-life and not required to be replaced, as per Section 3.2.2.

**Table 3-1 Configuration of Existing RADAR Transceivers and Antenna Systems per Site**

Regions		Sites	Dual RADARs (Main & backup)	Peak Power	Antenna Systems			
					≥ 21'	18'	8'	7'
ATLANTIC (North)	1	Arnolds Cove	Raytheon R50	50 kW	CHL 21'			
	2	Cuslett	Raytheon R50	50 kW	CHL 21'			

	3	Pearce Peak	Raytheon R50	50 kW	CHL 21'			
	4	Port Aux Basques	Decca Bridgemaster	25 kW			1	
<b>ATLANTIC</b> (South)	5	Chebucto Head	Decca Bridgemaster	25 kW			1	
	6	Georges Island*	Decca Bridgemaster	25 kW			1	
	7	Shannon Hill	Decca Bridgemaster	25 kW			1	
	8	Partridge Island	Decca Bridgemaster	25 kW			1	
	9	Red Head	CMC CMR-91 Marconi	25 kW	Easat 25'			
	10	Tiverton	CMC CMR-91 Marconi	25 kW	Easat 25'			
	11	Eddy Point	Decca Bridgemaster	25 kW			1	
<b>CENTRAL &amp; ARCTIC</b> (C&A) (St. Laurent)	12	Les Escoumins	Scanter 2001 F1 + F2	25 kW	<i>Terma 21'</i>			
	13	Île Charron	Raytheon R50	50 kW	<i>CHL 21'</i>			
	14	Pont Jacques Cartier**	Scanter 2001	4-5 kW				<i>Terma 7'</i>
	15	Lévis	Raytheon R50	50 kW	<i>CHL 21'</i>			
<b>C&amp;A</b> (Great Lakes)	16	Point Edward	Early Scanter 2001	25 kW	<i>CHL 21'</i>			
<b>WESTERN</b>	17	Mt. Ozzard	Scanter 2001 F1 + F2	25 kW	AIL 25'			
	18	Berry Point	Scanter 2001 F1 + F2	25 kW		1		
	19	Kap 100	Scanter 2001 F1 + F2	25 kW		1		
	20	Bowen Island	Scanter 2001 F1 + F2	25 kW	AIL 25'			
	21	Mt. Helmcken	Scanter 2001 F1 + F2	25 kW	AIL 25'			

	22	Mt. Newton	Scanter 2001 F1 + F2	25 kW	AIL 32'			
	23	Mt. Parke	Scanter 2001 F1 + F2	25 kW	AIL 25'			

\* The Georges Island RADAR antenna is limited to 8' for clearance of obstacles.

\*\* The Pont Jacques Cartier RADAR antenna is limited to 7' for clearance of obstacles.

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### **3.4 RADAR TRANSCEIVER AND ANTENNA SYSTEM TO BE DELIVERED**

3.4.1 The configuration of the supplied Transceiver equipment must include:

- 3.4.1.1 Dual Solid-State X-Band RADAR Transceivers in redundant configuration (Main/Backup);
- 3.4.1.2 Waveguide switch, dummy loads;
- 3.4.1.3 Transceiver Control Application (software package); and
- 3.4.1.4 RADAR Maintenance Display and software tool.

3.4.2 Antenna Systems must be fixed panels or conventional rotating VTS antenna systems.

3.4.3 Conventional rotating VTS Antenna Systems, as a minimum, should consist of the following units:

- 3.4.3.1 Antenna;
- 3.4.3.2 Turning Unit;
- 3.4.3.3 Waveguide adaptors;
- 3.4.3.4 Motor;
- 3.4.3.5 Motor Starter;
- 3.4.3.6 Frequency Inverter;
- 3.4.3.7 Dual azimuth encoders; and
- 3.4.3.8 Various sensors and safety interlocks.

3.4.4 If fixed antenna panels are used, the number of panels needed to provide the required azimuth coverage must be specified.

### 3.5 QUANTITIES OF RADAR TRANSCEIVER EQUIPMENT TO BE DELIVERED

3.5.1 The quantities of Dual and Single RADAR Transceivers equipment are shown in Table 3-2 below.

**Table 3-2 Quantities of RADAR Transceiver equipment to be delivered**

ID	Region	Site
T 3-2.1	<b>ATLANTIC</b> (North)	Arnolds Cove
T 3-2.2		Cuslett
T 3-2.3		Pearce Peak
T 3-2.4		Port aux Basques
T 3-2.5		Site A (new site)
T 3-2.6		Site B (new site)
T 3-2.7		Site D (new site)
T 3-2.8	<b>ATLANTIC</b> (South)	Chebucto Head
T 3-2.9		Georges Island
T 3-2.10		Shannon Hill
T 3-2.11		Partridge Island
T 3-2.12		Red Head
T 3-2.13		Tiverton
T 3-2.14		Eddy Point
T 3-2.15		Site J (new site)
T 3-2.16		Site K (new site)
T 3-2.17	<b>C&amp;A</b> (St. Lawrence)	Île Charron
T 3-2.18		Lévis
T 3-2.19		Les Escoumins
T 3-2.20		Pont Jacques Cartier
T 3-2.21	<b>C&amp;A (Great</b>	Point Edward
T 3-2.22	<b>WESTERN</b> <b>REGION</b>	Mt. Ozzard
T 3-2.23		Berry Point
T 3-2.24		Kap 100
T 3-2.25		Bowen Island
T 3-2.26		Mt. Helmcken

ID	Region	Site
T 3-2.27		Mt. Newton
T 3-2.28		Mt. Parke
T 3-2.29		Site C (new site)
T 3-2.30		Site E (new site)
T 3-2.31		Site F (new site)
T 3-2.32		Site G (new site)
T 3-2.33		Site H (new site)
T 3-2.34		Site I (new site)
T 3-2.35	<b>CCG College</b>	Sydney, Nova Scotia (NS)
T 3-2.36	<b>CCG Test Lab</b>	Québec City, Québec (QC)
T 3-2.37	<b>Spare</b>	To be determined
T 3-2.38		<b>TOTAL:</b> <b>- 35 Dual Transceivers (1 per site, 1 for CCG college)</b> <b>- TBD # of Dual Transceiver(s) for CCG Test Lab</b> <b>- TBD # of Single Spare Transceiver(s)</b>

## 3.6 QUANTITIES OF RADAR ANTENNA SYSTEMS TO BE DELIVERED

3.6.1 The quantities of replacement RADAR Antenna Systems are shown in Table 3-3 below.

**Table 3-3 Quantities of RADAR Antenna Systems to be delivered**

ID	Regions	Site	RADAR Antenna Systems
T 3-3.1	<b>ATLANTIC</b> (North)	Arnolds Cove	1
T 3-3.2		Cuslett	1
T 3-3.3		Pearce Peak	1
T 3-3.4		Port aux Basques	1
T 3-3.5		Site A (new site)	1
T 3-3.6		Site B (new site)	1
T 3-3.7		Site D (new site)	1
T 3-3.8	<b>ATLANTIC</b> (South)	Chebucto Head	1
T 3-3.9		Georges Island	1
T 3-3.10		Shannon Hill	1
T 3-3.11		Partridge Island	1
T 3-3.12		Red Head	1
T 3-3.13		Tiverton	1
T 3-3.14		Eddy Point	1
T 3-3.15		Site J (new site)	1
T 3-3.16		Site K (new site)	1
T 3-3.17	<b>C&amp;A</b> (St. Lawrence)	Île Charron	0 or 1
T 3-3.18		Lévis	0 or 1
T 3-3.19		Les Escoumins	0 or 1
T 3-3.20		Pont Jacques Cartier	0 or 1
T 3-3.21	<b>C&amp;A</b> (Great Lakes)	Point Edward	0 or 1
T 3-3.22	<b>WESTERN REGION</b>	Mt. Ozzard*	1
T 3-3.23		Berry Point	1
T 3-3.24		Kap 100	1
T 3-3.25		Bowen Island	1

<b>ID</b>	<b>Regions</b>	<b>Site</b>	<b>RADAR Antenna Systems</b>
T 3-3.26		Mt. Helmcken	1
T 3-3.27		Mt. Newton	1
T 3-3.28		Mt. Parke	1
T 3-3.29		Site C (new site)	1
T 3-3.30		Site E (new site)	1
T 3-3.31		Site F (new site)	1
T 3-3.32		Site G (new site)	1
T 3-3.33		Site H (new site)	1
T 3-3.34		Site I (new site)	1
T 3-3.35	<b>CCG College</b>	Sydney, NS	1
T 3-3.36	<b>CCG Test Lab</b>	Québec City, QC	1
T 3-3.37	<b>Spare Antenna Systems</b>	To be determined	Quantity and sizes to be determined
T 3-3.38		<b>TOTALS</b>	- 31 to 36 Antenna Systems - TBD # of spares Antenna Systems

\* Mount Ozzard RADAR Antenna System is in a radome.

### 3.7 CURRENT AND NEW RADAR SITE LOCATIONS AND ELEVATIONS

3.7.1 The thirty-six (36) CCG RADAR sites, relevant to this specification, are listed in Table 3-4. The list includes the RADAR site names, antenna elevation above mean sea level (AMSL) (AMSL is referenced to either sea level or local water level), and antenna height above ground level (AGL). A RADAR is included for training purposes at the Coast Guard College in Sydney, NS, and one for testing at the Test Lab in Québec City, QC.

**Table 3-4 Locations of the RADAR Sites and Elevations<sup>1</sup>**

Regions	Sites	Latitude	Longitude	Antenna Elevation AMSL (m)	Ht. Above Ground AGL (m)
<b>ATLANTIC (North)</b>	Arnolds Cove	47°46'23.0"N	53°59'58.5"W	95.4	24.4
	Cuslett	46°58'28.1"N	54°09'15.3"W	158.7	24.4
	Pearce Peak	47°17'28.3"N	53°58'09.0"W	148.2	15.2
	Port aux Basques	47°34'19.0"N	59°07'56.9"W	58.4	24.4
	Site A (new site)	--- <sup>3</sup>	--- <sup>3</sup>	41	24
	Site B (new site)	--- <sup>3</sup>	--- <sup>3</sup>	148	24
	Site D (new site)	--- <sup>3</sup>	--- <sup>3</sup>	27	24
<b>ATLANTIC (South)</b>	Chebucto Head	44°30'27.0"N	63°31'22.3"W	47.0	16.0
	Georges Island	44°38'26.1"N	63°33'31.5"W	30.0	13.0
	Shannon Hill	44°41'02.8"N	63°36'36.0"W	42.0	19.0
	Partridge Island	45°14'21.1"N	66°03'13.8"W	46.0	14.0
	Red Head	45°14'00.7"N	65°59'03.4"W	155.0	16.0
	Tiverton	44°23'23.5"N	66°13'21.3"W	101.0	25.0
	Eddy Point	45°30'47.9"N	61°15'10.8"W	83.0	25.0
	Site J (new site)	--- <sup>3</sup>	--- <sup>3</sup>	26	24
	Site K (new site)	--- <sup>3</sup>	--- <sup>3</sup>	66	24
<b>C&amp;A (St. Lawrence)</b>	Les Escoumins <sup>2</sup>	48°19'03.8"N	69°25'13.4"W	85.0	32.0
	Île Charron <sup>2</sup>	45°35'03.7"N	73°29'39.5"W	51.0	49.0
	Pont Jacques Cartier <sup>2</sup>	45°31'16.2"N	73°32'20.4"W	49.5	40.5
	Lévis <sup>2</sup>	46°49'09.5"N	71°10'59.8"W	57.0	34.0
<b>C&amp;A (Great Lakes)</b>	Point Edward <sup>2</sup>	43°00'04.1"N	82°25'05.8"W	20.0	16.0
<b>WESTERN</b>	Mt. Ozzard	48°57'34.2"N	125°29'35.0"W	680.0	10.0
	Berry Point	49°17'42.9"N	122°59'13.3"W	12.2	12.2
	Kap 100	49°19'31.3"N	123°08'01.2"W	64.0	55.0
	Bowen Island	49°20'40.8"N	123°23'17.2"W	355.3	18.3
	Mt. Helmcken	48°24'07.1"N	123°34'22.0"W	338.3	18.3

	Mt. Newton	48°36'47.4"N	123°26'35.8"W	324.4	24.4
	Mt. Parke	48°50'23.1"N	123°17'45.6"W	224.4	24.4
	Site C (new site)	--- <sup>3</sup>	--- <sup>3</sup>	77	45
	Site E (new site)	--- <sup>3</sup>	--- <sup>3</sup>	850	24
	Site F (new site)	--- <sup>3</sup>	--- <sup>3</sup>	868	45
	Site G (new site)	--- <sup>3</sup>	--- <sup>3</sup>	505	24
	Site H (new site)	--- <sup>3</sup>	--- <sup>3</sup>	742	24
	Site I (new site)	--- <sup>3</sup>	--- <sup>3</sup>	296	24
<b>CCG College</b>	Sydney, NS	46°08'52.2"N	60°13'25.9"W	N/A	N/A
<b>Test Lab</b>	Québec, QC	46°48'38.4"N	71°12'07.9"W	N/A	N/A

**Notes:**

1. The site data in this table are to be used for any site performance calculations.
2. Above local water level.
3. The precise locations of the new sites will not be published until after the contract is awarded.

## 4 APPLICABLE DOCUMENTATION

### 4.1 SPECIFICATION AND PRECEDENCE

- 4.1.1 The following documents are applicable to this specification. In the case of a conflict between the wording elsewhere in this specification and the applicable documents, the CCG documentation wording must take precedence.
- 4.1.1.1 RADAR Equipment Replacements Statement of Work (SOW), EKME# 3468591 (English).
  - 4.1.1.2 RADAR Transceiver and Antenna TSOR, EKME# 3614054 (English).
  - 4.1.1.3 RADAR Extractor/Tracker TSOR, EKME# 3614056 (English).
  - 4.1.1.4 IALA Guideline 1111, Edition 1, May 2015, on “Preparation of Operational and Technical Performance Requirements for VTS Systems”.  
<http://www.iala-aism.org/product/preparation-of-operational-and-technical-performance-for-vts-equipment/>
  - 4.1.1.5 Health Canada’s – Safety Code 6 (2015) “Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz.”. This document is available at: [http://www.hc-sc.gc.ca/ewh-semt/alt\\_formats/pdf/consult/2014/safety\\_code\\_6-code\\_securite\\_6/final-finale-eng.pdf](http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/consult/2014/safety_code_6-code_securite_6/final-finale-eng.pdf)
  - 4.1.1.6 Electrical Safety Authority – Electrical Product Approval Requirements. This document is available at: [https://www.esasafe.com/assets/files/esasafe/pdf/Electrical\\_Product\\_Safety/ESA-ProductApprovalCard-Final-web.pdf](https://www.esasafe.com/assets/files/esasafe/pdf/Electrical_Product_Safety/ESA-ProductApprovalCard-Final-web.pdf)
  - 4.1.1.7 Department of Defence – MIL-HDBK-217F, “Reliability Prediction of Electronic Equipment. This document is available at: [https://www.weibull.com/mil\\_std/mil\\_hdbk\\_217f.pdf](https://www.weibull.com/mil_std/mil_hdbk_217f.pdf)
  - 4.1.1.8 ITU-R SM.329-10, “Unwanted Emissions in the Spurious Domain”. This document is available at: [https://www.itu.int/dms\\_pubrec/itu-r/rec/sm/R-REC-SM.329-10-200302-S!!PDF-E.pdf](https://www.itu.int/dms_pubrec/itu-r/rec/sm/R-REC-SM.329-10-200302-S!!PDF-E.pdf)
  - 4.1.1.9 ITU-R SM.1541-2, Annex 8, “Unwanted Emissions in the out-of-band Domain.” This document is available at: <https://www.itu.int/rec/R-REC-SM.1541-6-201508-I>



## 5 LIST OF ACRONYMS AND INITIALISMS

A	Acting
AC	Alternating current
ACP	Azimuth Change Pulse
AFC	Automatic Frequency Control
AGL	Above Ground Level
AMSL	Above Mean Sea Level
ARP	Azimuth Reference Pulse
ASC	Auto-adaptive Sensitivity Control
ASL	Above Sea Level
AtoN	Aids to Navigation
BIST	Built-In Self-Test
C	Celsius
C&A	Central & Arctic
CARPET	Computer-Aided RADAR Performance Evaluation Tool
CCG	Canadian Coast Guard
CRF	Chirp Repetition Frequency
dB	Decibel
dB <sub>i</sub>	Gain in dB relative to an isotropic antenna
dB <sub>m</sub>	Gain in dB milliwatts
DC	Direct Current
E&I	Electronics & Informatics
EKME	Electronic Knowledge Management Environment
Elev	Elevation
ESA	Electrical Safety Authority
FM	Frequency Modulation
FTC	Fast Time Constant
GFE	Government Furnished Equipment
GIT	Georgia Institute of Technology
GHz	Gigahertz
H	Horizontal
H&V	Horizontal and Vertical
hr	Hour
Ht.	Height
Hz	Hertz
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities

INNAV	Information System on Marine Navigation
IP	Internet Protocol
ITS	Integrated Technical Services
kg	kilogram
km	kilometre
kW	kilowatt
LCD	Liquid Crystal Display
m	metre
Mbps	Megabits per second
MCP	Maintenance Control Position
MCTS	Marine Communications and Traffic Services
MDR	Minimum Detected Range
MDS	Minimum Discernible Signal
MIB	Management Information Base
MHz	Megahertz
mm	millimetre
MTI	Moving Target Indicator
m/s	metre per second
MS	Microsoft
Mt.	Mount
MTBF	Mean Time Between Failure
MTTR	Mean Time to Repair
N/A	Not applicable
NM	Nautical Miles
ns	nanosecond
NS	Nova Scotia
OCP	Operator Control Position
OPI	Office of Primary Interest
PA	Power Amplifier
PC	Personal Computer
P <sub>D</sub>	Probability of Detection
P <sub>FA</sub>	Probability of False Alarm
PM	Project Manager
PRF	Pulse Repetition Frequency
pps	Pulse per Second
PW	Pulse Width
QC	Québec

RACON	RADAR Beacon
RCS	RADAR Cross Section
RF	Radio Frequency
RMS	Root mean square
RPM	Revolution Per Minute
RSS	Radio Standard Specification
Rx	Receive or Receiver
SAT	Site Acceptance Test
S/N	Signal to Noise
SNMP	Simple Network Management Protocol
SOW	Statement of Work
SS	Sea State
SSPA	Solid-State Power Amplifier
STC	Sensitivity Time Control
TA	Technical Authority
TBD	To Be Determined
TCP	Transmission Control Protocol
TSOR	Technical Statement of Requirements
TTL	Transistor-Transistor-Logic
Tx	Transmitter or Transmit
TX1 & TX2	Transmitter No. 1 & Transmitter No. 2
UBR	A type of rectangular waveguide mounting flange
UDP	User Datagram Protocol
VAC	Volts Alternating Current
VSWR	Voltage Standing Wave Ratio
VTMIS	Vessel Traffic Management Information System
VTs	Vessel Traffic Services
W	Watt
WR90	A particular size of rectangular waveguide

## **6 RADAR TRANSCEIVER AND ANTENNA SYSTEM PERFORMANCE GUIDELINES**

### **6.1 RADAR RANGE PERFORMANCE**

- 6.1.1 The RADAR range performance specifications are based on the guidelines outlined in International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guideline No. 1111, “Preparation of Operational and Technical Performance Requirements for Vessel Traffic Services (VTS) Systems” except where modified by CCG. RADAR range parameters are listed in Section 7.3 of this document.
- 6.1.2 For purposes of this specification, X-Band target detection requirements range from IALA Type 1 (1 m<sup>2</sup> RCS) to IALA Type 7 (100,000 m<sup>2</sup> RCS) as defined in Table 7-1 and 7-2.
- 6.1.3 The site-specific requirements listed in Tables 7-4 to 7-8 below have been grouped into the five (5) Regional locations.

### **6.2 RANGE AND AZIMUTH, RESOLUTION AND ACCURACY**

- 6.2.1 The site-specific requirements listed in Table 7-9 below have been grouped into three (3) categories based on sites with similar operational requirements, which are a function of antenna height and size, and geography.

## **7 RADAR TRANSCEIVER AND ANTENNA SYSTEM OPERATIONAL AND SURVEILLANCE REQUIREMENTS**

### **7.1 OPERATIONAL PURPOSE**

- 7.1.1 The primary operational purpose of the RADAR Transceiver and Antenna System is to provide independent detection of vessels and watercraft.

### **7.2 DETECTION RANGE PERFORMANCE**

- 7.2.1 The RADAR Transceiver and Antenna System must be able to detect all moving and stationary targets meeting the specified detection criteria within the coverage area (excluding obstructed coverage). Target detection criteria are based on a Probability of Detection ( $P_D$ ) of 80%, with a Probability of False Alarm  $P_{FA}$  of  $10^{-6}$ , including the effects of Signal to Noise (S/N) improvements through signal processing.
- 7.2.2 Table 7-1 shows the lists of targets used in specifying the RADAR performance criteria according to Table 8 of the IALA Guideline 1111 for Technical Performance Requirements for VTS Equipment.
- 7.2.3 Table 7-2 shows the target types related to capability of detection.
- 7.2.4 Table 7-3 shows the Sea States (SS) used in specifying the RADAR Transceiver and Antenna System performance requirements. The Sea State has a direct impact on the RADAR performance as it affects the Sea Clutter level. The IALA Guideline 1111 uses the GIT (Georgia Institute of Technology) model for Sea State. The Sea State scale and average Computer-Aided RADAR Performance Evaluation Tool (CARPET) wave heights, are included.

**Table 7-1 IALA Target Types**

<b>IALA Point Target Types</b>					
<b>Target Type</b>	<b>Typically Representing</b>	<b>RADAR Cross Section</b>		<b>Height (ASL)</b>	<b>Fluctuation</b>
		<b>S-Band</b>	<b>X-Band</b>		
1	AtoN without RADAR reflector. Small open boats, fibreglass, wood or rubber with outboard motor and, at least, 4 metres long. Small speedboats, small fishing vessels, and small sailing boats.	$\ll 1 \text{ m}^2$	$1 \text{ m}^2$	1 m	Rapid, depending on sea state and target movement
2	In-shore fishing vessels, sailing boats and speedboats.	$< 1 \text{ m}^2$	$3 \text{ m}^2$	2 m	
3	Aids to Navigation with RADAR reflector.	$4 \text{ m}^2$	$10 \text{ m}^2$	3 m	
4	Small metal ships, fishing vessels and patrol vessels.	$40 \text{ m}^2$	$100 \text{ m}^2$	5 m	Moderate
5	Small coasters and large fishing trawlers.	$400 \text{ m}^2$	$1,000 \text{ m}^2$	8 m	
6	Large coasters, bulk carriers and cargo ships.	$4,000 \text{ m}^2$	$10,000 \text{ m}^2$	12 m	Negligible
7	Container carriers and tankers.	$40,000 \text{ m}^2$	$100,000 \text{ m}^2$	18 m	

From IALA Guideline 1111 – Preparation of Operational and Technical Performance Requirements for VTS Systems - Edition 1, May 2015 Table 8 - Note: “RCS values are average values for the distribution of single pulse RADAR echoes. The indicated values include allowance for the RCS-limiting effect of the cell size in the case of RADARs with high-resolution (see also table 9)”.

**Table 7-2 Targets to be Detected**

IALA Target Type	Typically Representing	Capability		
		Basic	Standard	Advanced
1	Aids to Navigation without RADAR reflector. Small open boats, fibreglass, wood or rubber with outboard motor and, at least, 4 metres long. Small speedboats, small fishing vessels, small sailing boats and the like.			X
2	In-shore fishing vessels, sailing boats, speedboats and the like.		X	X
3	Aids to Navigation with RADAR reflector.	X	X	X
4	Small metal ships, fishing vessels, patrol vessels and the like.	X	X	X
5	Coasters and the like.	X	X	X
6	Large coasters, bulk carriers, cargo ships and the like.	X	X	X
7	Container carriers, tankers etc.	X	X	X

From IALA Guideline 1111 – Preparation of Operational and Technical Performance Requirements for VTS Systems - Edition 1, May 2015 Table 10 - “Table 10 lists the IALA target types to be detected for different levels of capability. Refer to table 8 for IALA target definitions. Obviously, smaller targets at close range are detectable by RADARs in any of the categories, but table 10 indicates the minimum applicable for VTS”.

**Table 7-3 Douglas (GIT) Sea State Table**

Sea State	Descriptive Term	Wave Height [m]	
		Average (CARPET)	Significant
0	Calm	0.0	0.0
1	Smooth	0.1	0.2
2	Slight	0.3	0.5
3	Moderate	0.7	1.2
4	Rough	1.3	2.2
5	Very Rough	2.0	3.3
6	High	2.9	4.8
7	Very High	3.9	6.5
8	Precipitous	5.1	8.5

Table 7-3 is from IALA Guideline 1111 – Preparation of Operational and Technical Performance Requirements for VTS Systems - Edition 1, May 2015 Table 11.



### **7.3 SITE-SPECIFIC RADAR RANGE PERFORMANCE, TARGET POSITION (RANGE & AZIMUTH) RESOLUTION & ACCURACY REQUIREMENTS**

- 7.3.1 The RADAR Transceivers and Antenna Systems must meet the requirements defined in the Table 7-4 to 7-8, which are based upon standards for vessel detection by the replacement RADAR equipment, disregarding the limitations of the site-specific RADAR horizon. However, RADAR coverage to longer ranges or for smaller targets is a benefit to the surveillance of the region. The detection ranges listed in Table 7-4 to 7-8 are based on using a Swerling Case 1, a nominal 80%  $P_D$  and a  $P_{FA}$  of  $10^{-6}$ , Sea State 3, horizontal polarization.
- 7.3.2 In order to establish required detection ranges specified in the Table 7-4 to 7-8, the site requirements were analyzed using CARPET 2, which allows pulse compression simulation.
- 7.3.3 The results in the Table 7-4 to 7-8, have been rounded off to the nearest whole number, and represent the minimum required results for each site based upon assumed antenna types, antenna elevations, power and other parameters, as entered into CARPET.
- 7.3.4 The Contractor must provide with the bid, a range table for each site (for site data, see Section 3.7.1), using the parameters of Swerling Case 1, a nominal 80%  $P_D$  and a  $P_{FA}$  of  $10^{-6}$ , Sea State 3, horizontal polarization, and presenting the results in the same format as shown in Table 7-4 to 7-8. For conventional RADAR Transceivers and Antenna Systems, the Contractor must do simulations using CARPET. Non-conventional RADAR Transceivers and Antenna Systems (e.g., phased array RADAR) may require different analysis software (Contractor to specify). In either case, the Contractor must list the detailed parameters and assumptions used for calculating the new RADAR Transceivers and Antenna Systems performance in each case.
- 7.3.5 The RADAR Transceivers and Antenna Systems must meet the site-specific target position (range & azimuth) resolution and accuracy requirements listed in Table 7-9.

**Table 7-4 Atlantic Region (North)**

ID	Site	Elev ASL m	IALA Target Type	Target RCS m <sup>2</sup>	Range Clear NM	Range 4mm/h Rain NM	Range 16mm/h Rain NM	Target Horizon NM
T 7-4.1	<b>Arnolds Cove</b>	95.4	1	1	11	9	6	23.9
T 7-4.2			2	3	15	14	10	24.9
T 7-4.3			3	10	19	15	14	25.5
T 7-4.4			4	100	20	19	18	26.6
T 7-4.5			5	1 000	24	24	23	28.0
T 7-4.6			6	10 000	28	28	27	29.4
T 7-4.7			7	100 000	29	29	28	31.1
T 7-4.8	<b>Cuslett</b>	158.7	1	1	13	11	4	30.2
T 7-4.9			2	3	19	17	7	31.2
T 7-4.10			3	10	23	18	14	31.8
T 7-4.11			4	100	27	20	18	32.9
T 7-4.12			5	1 000	30	30	29	34.2
T 7-4.13			6	10 000	34	34	34	35.7
T 7-4.14			7	100 000	36	36	36	37.4
T 7-4.15	<b>Pearce Peak</b>	148.2	1	1	11	11	4	28.7
T 7-4.16			2	3	18	17	7	30.3
T 7-4.17			3	10	20	18	10	30.4
T 7-4.18			4	100	25	20	14	32.0
T 7-4.19			5	1 000	29	28	18	32.8
T 7-4.20			6	10 000	32	32	23	34.7
T 7-4.21			7	100 000	34	34	26	36.4
T 7-4.22	<b>Port aux Basques</b>	58.4	1	1	5	5	4	19.2
T 7-4.23			2	3	7	6	3	20.2
T 7-4.24			3	10	12	12	5	20.8
T 7-4.25			4	100	15	13	7	21.9
T 7-4.26			5	1 000	17	17	10	23.2
T 7-4.27			6	10 000	20	19	12	24.7
T 7-4.28			7	100 000	22	22	14	26.3
T 7-4.29	<b>Site A (new site)</b>	41	1	1	5	5	4	16.5
T 7-4.30			2	3	8	7	6	17.4
T 7-4.31			3	10	10	9	8	18.1
T 7-4.32			4	100	13	12	11	19.2
T 7-4.33			5	1 000	16	15	14	20.6
T 7-4.34			6	10 000	19	18	16	22
T 7-4.35			7	100 000	22	21	19	23.7
T 7-4.36	<b>Site B (new site)</b>	166	1	1	13	11	4	30.9
T 7-4.37			2	3	19	16	7	31.8
T 7-4.38			3	10	22	21	11	32.5
T 7-4.39			4	100	27	26	15	33.7
T 7-4.40			5	1 000	30	30	20	35
T 7-4.41			6	10 000	34	33	23	36.4
T 7-4.42			7	100 000	37	36	32	38.1
T 7-4.43	<b>Site D (new site)</b>	27	1	1	3	3	3	13.8
T 7-4.44			2	3	5	5	4	14.7

T 7-4.45			3	10	7	6	6	15.4
T 7-4.46			4	100	10	9	8	16.6
T 7-4.47			5	1 000	12	12	11	17.9
T 7-4.48			6	10 000	15	15	13	19.3
T 7-4.49			7	100 000	18	18	16	21

**Table 7-5 Atlantic Region (South)**

ID	Site	Elev ASL m	IALA Target Type	Target RCS m <sup>2</sup>	Range Clear NM	Range 4mm/h Rain NM	Range 16mm/ h Rain NM	Target Horizon NM
T 7-5.1	<b>Chebucto Head</b>	47.0	1	1	4	4	1	17.4
T 7-5.2			2	3	6	3	2	18.4
T 7-5.3			3	10	8	8	3	19.1
T 7-5.4			4	100	12	11	3	20.2
T 7-5.5			5	1 000	15	15	12	21.5
T 7-5.6			6	10 000	18	18	16	22.9
T 7-5.7			7	100 000	22	21	19	24.6
T 7-5.8	<b>Georges Island</b>	30.0	1	1	3	3	2	14.4
T 7-5.9			2	3	5	5	2	15.3
T 7-5.10			3	10	6	6	2	16.0
T 7-5.11			4	100	9	9	8	17.1
T 7-5.12			5	1 000	12	12	10	18.4
T 7-5.13			6	10 000	15	15	13	19.8
T 7-5.14			7	100 000	19	18	16	21.6
T 7-5.15	<b>Shannon Hill</b>	42.0	1	1	4	3	1	16.6
T 7-5.16			2	3	5	5	2	17.5
T 7-5.17			3	10	7	6	3	18.2
T 7-5.18			4	100	11	11	5	19.4
T 7-5.19			5	1 000	14	14	11	20.7
T 7-5.20			6	10 000	17	17	14	22.1
T 7-5.21			7	100 000	20	20	18	23.8
T 7-5.22	<b>Partridge Island</b>	46.0	1	1	4	3	1	17.3
T 7-5.23			2	3	5	3	2	18.2
T 7-5.24			3	10	7	4	3	18.9
T 7-5.25			4	100	11	11	6	20.0
T 7-5.26			5	1 000	15	14	8	21.3
T 7-5.27			6	10 000	18	17	15	22.7
T 7-5.28			7	100 000	21	20	18	24.5
T 7-5.29	<b>Red Head</b>	155.0	1	1	4	4	2	29.9
T 7-5.30			2	3	8	7	4	30.8
T 7-5.31			3	10	11	10	6	31.5
T 7-5.32			4	100	24	22	10	32.6
T 7-5.33			5	1 000	28	27	18	33.9
T 7-5.34			6	10 000	31	31	22	35.3
T 7-5.35			7	100 000	35	34	25	37.1

T 7-5.36	<b>Tiverton</b>	101.0	1	1	8	7	3	24.5
T 7-5.37			2	3	12	11	5	25.5
T 7-5.38			3	10	15	14	7	26.2
T 7-5.39			4	100	20	19	11	26.6
T 7-5.40			5	1 000	23	23	14	28.6
T 7-5.41			6	10 000	26	26	22	30.0
T 7-5.42			7	100 000	30	29	26	31.7
T 7-5.43	<b>Eddy Point</b>	83.0	1	1	2	2	1	22.4
T 7-5.44			2	3	4	4	2	23.4
T 7-5.45			3	10	6	6	3	24.1
T 7-5.46			4	100	14	9	8	25.2
T 7-5.47			5	1 000	19	18	12	26.5
T 7-5.48			6	10 000	23	22	15	27.9
T 7-5.49			7	100 000	26	25	19	29.6
T 7-5.50	<b>Site J (new site)</b>	26	1	1	5	5	4	13.6
T 7-5.51			2	3	7	7	6	14.5
T 7-5.52			3	10	9	9	8	15.2
T 7-5.53			4	100	12	11	10	16.3
T 7-5.54			5	1 000	14	14	12	17.7
T 7-5.55			6	10 000	17	17	15	19.1
T 7-5.56			7	100 000	20	20	18	20.8
T 7-5.57	<b>Site K (new site)</b>	66	1	1	6	6	5	20.3
T 7-5.58			2	3	9	9	4	21.2
T 7-5.59			3	10	12	11	5	21.9
T 7-5.60			4	100	16	15	8	23.1
T 7-5.61			5	1 000	19	18	16	24.4
T 7-5.62			6	10 000	22	21	19	25.8
T 7-5.63			7	100 000	25	25	22	27.5

**Table 7-6 Central & Arctic Region (St. Lawrence)**

ID	Site	Elev ASL m	IALA Target Type	Target RCS m <sup>2</sup>	Range Clear NM	Range 4mm/h Rain NM	Range 16mm/ h Rain NM	Target Horizon NM
T 7-6.1	Les Escoumins	85.0	1	1	8	7	6	22.8
T 7-6.2			2	3	14	13	9	23.7
T 7-6.3			3	10	16	15	12	24.3
T 7-6.4			4	100	21	17	15	25.4
T 7-6.5			5	1 000	23	22	20	26.8
T 7-6.6			6	10 000	26	25	23	28.2
T 7-6.7			7	100 000	28	28	24	29.9
T 7-6.8	Île Charron	51.0	1	1	7	7	6	18.1
T 7-6.9			2	3	11	10	8	19.0
T 7-6.10			3	10	15	13	9	19.7
T 7-6.11			4	100	16	15	13	20.8
T 7-6.12			5	1 000	19	18	16	22.2
T 7-6.13			6	10 000	22	22	19	23.5
T 7-6.14			7	100 000	23	23	20	25.3
T 7-6.15	Pont Jacques Cartier	49.5	1	1	4	4	3	17.9
T 7-6.16			2	3	6	6	3	18.8
T 7-6.17			3	10	8	8	4	19.7
T 7-6.18			4	100	13	11	9	20.6
T 7-6.19			5	1 000	16	15	12	21.9
T 7-6.20			6	10 000	18	18	15	23.3
T 7-6.21			7	100 000	23	23	20	25.0
T 7-6.22	Lévis	57.0	1	1	8	7	6	19.0
T 7-6.23			2	3	11	10	9	19.9
T 7-6.24			3	10	13	13	10	20.6
T 7-6.25			4	100	16	16	13	21.7
T 7-6.26			5	1 000	19	19	19	23.1
T 7-6.27			6	10 000	23	22	20	24.5
T 7-6.28			7	100 000	25	24	23	26.2

**Table 7-7 Central & Arctic (Great Lakes)**

ID	Site	Elev ASL m	IALA Target Type	Target RCS m <sup>2</sup>	Range Clear NM	Range 4mm/h Rain NM	Range 16mm/h Rain NM	Target Horizon NM
T 7-7.1	Point Edward <sup>(1)</sup>	20.0	1	1	4	4	4	12.2
T 7-7.2			2	3	5	5	4	13.1
T 7-7.3			3	10	7	7	6	13.8
T 7-7.4			4	100	10	9	8	14.9
T 7-7.5			5	1 000	13	13	11	16.3
T 7-7.6			6	10 000	15	15	14	17.6
T 7-7.7			7	100 000	17	17	15	19.3

Note (1): Above Lake Level

**Table 7-8 Western Region**

ID	Site	Elev ASL m	IALA Target Type	Target RCS m <sup>2</sup>	Range Clear NM	Range 4mm/h Rain NM	Range 16mm/ h Rain NM	Target Horizon NM
T 7-8.1	<b>Mt. Ozzard</b>	680.0	1	1	16	10	5	60.4
T 7-8.2			2	3	20	11	8	61.3
T 7-8.3			3	10	28	20	13	61.7
T 7-8.4			4	100	54	40	18	62.9
T 7-8.5			5	1 000	59	58	26	64.4
T 7-8.6			6	10 000	64	60	32	65.6
T 7-8.7			7	100 000	67	64	43	67.3
T 7-8.8	<b>Berry Point</b>	12.2	1	1	3	3	2	10.0
T 7-8.9			2	3	4	4	3	10.9
T 7-8.10			3	10	7	7	5	11.6
T 7-8.11			4	100	9	8	6	12.7
T 7-8.12			5	1 000	10	10	9	14.1
T 7-8.13			6	10 000	12	12	11	15.4
T 7-8.14			7	100 000	14	14	13	17.2
T 7-8.15	<b>Kap 100</b>	64.0	1	1	6	6	4	20.0
T 7-8.16			2	3	9	9	7	20.9
T 7-8.17			3	10	13	11	8	21.6
T 7-8.18			4	100	16	14	11	22.7
T 7-8.19			5	1 000	19	18	15	24.1
T 7-8.20			6	10 000	22	21	19	25.5
T 7-8.21			7	100 000	24	23	21	27.2
T 7-8.22	<b>Bowen Island</b>	355.3	1	1	9	7	4	44.2
T 7-8.23			2	3	15	10	5	45.1
T 7-8.24			3	10	16	14	8	45.7
T 7-8.25			4	100	36	32	15	46.8
T 7-8.26			5	1 000	43	41	21	48.3
T 7-8.27			6	10 000	48	48	28	49.5
T 7-8.28			7	100 000	50	50	30	51.3
T 7-8.29	<b>Mt. Helmcken</b>	338.3	1	1	9	8	4	43.2
T 7-8.30			2	3	15	9	5	44.1
T 7-8.31			3	10	19	15	11	44.7
T 7-8.32			4	100	35	32	14	45.8
T 7-8.33			5	1 000	42	40	21	47.3
T 7-8.34			6	10 000	47	47	26	48.5
T 7-8.35			7	100 000	49	49	28	50.3
T 7-8.36	<b>Mt. Newton</b>	324.4	1	1	8	7	6	42.3
T 7-8.37			2	3	14	13	6	43.2
T 7-8.38			3	10	18	14	10	43.8
T 7-8.39			4	100	35	34	14	44.9
T 7-8.40			5	1 000	41	40	20	46.4
T 7-8.41			6	10 000	47	47	26	47.7
T 7-8.42			7	100 000	48	48	27	49.4
T 7-8.43	<b>Mt. Parke</b>	224.4	1	1	14	6	3	35.6
T 7-8.44			2	3	20	11	6	36.5
T 7-8.45			3	10	24	20	12	37.1

T 7-8.46			4	100	30	28	16	38.2
T 7-8.47			5	1 000	35	34	23	39.6
T 7-8.48			6	10 000	38	38	29	40.9
T 7-8.49			7	100 000	40	40	30	42.6
T 7-8.50	<b>Site C (new site)</b>	77	1	1	5	4	2	21.8
T 7-8.51			2	3	4	4	4	22.7
T 7-8.52			3	10	6	6	5	23.4
T 7-8.53			4	100	16	15	8	24.5
T 7-8.54			5	1 000	19	19	11	25.8
T 7-8.55			6	10 000	23	22	14	27.3
T 7-8.56			7	100 000	26	25	22	29
T 7-8.57	<b>Site E (new site)</b>	850	1	1	9	7	4	67.1
T 7-8.58			2	3	12	9	6	68.1
T 7-8.59			3	10	18	13	8	68.8
T 7-8.60			4	100	39	27	13	69.9
T 7-8.61			5	1 000	63	47	18	71.2
T 7-8.62			6	10 000	68	66	25	72.6
T 7-8.63			7	100 000	71	70	32	74.4
T 7-8.64	<b>Site F (new site)</b>	868	1	1	9	7	4	67.8
T 7-8.65			2	3	12	9	5	68.8
T 7-8.66			3	10	16	13	7	69.5
T 7-8.67			4	100	39	27	13	70.6
T 7-8.68			5	1 000	64	47	19	71.9
T 7-8.69			6	10 000	68	66	24	73.3
T 7-8.70			7	100 000	72	71	32	75.1
T 7-8.71	<b>Site G (new site)</b>	505	1	1	8	7	4	52.3
T 7-8.72			2	3	13	10	5	53.2
T 7-8.73			3	10	19	14	8	53.9
T 7-8.74			4	100	44	33	14	55
T 7-8.75			5	1 000	50	47	21	56.3
T 7-8.76			6	10 000	53	52	27	57.8
T 7-8.77			7	100 000	57	56	33	59.5
T 7-8.78	<b>Site H (new site)</b>	742	1	1	8	7	4	62.9
T 7-8.79			2	3	11	9	6	63.8
T 7-8.80			3	10	16	13	8	64.5
T 7-8.81			4	100	43	28	13	65.6
T 7-8.82			5	1 000	60	49	19	67
T 7-8.83			6	10 000	64	62	26	68.4
T 7-8.84			7	100 000	67	66	33	70.1
T 7-8.85	<b>Site I (new site)</b>	296	1	1	8	7	4	40.5
T 7-8.86			2	3	14	13	6	41.5
T 7-8.87			3	10	18	18	9	42.2
T 7-8.88			4	100	35	33	17	43.3
T 7-8.89			5	1 000	39	38	22	44.6
T 7-8.90			6	10 000	42	41	27	46
T 7-8.91			7	100 000	46	45	31	47.8

**Table 7-9 Range and Azimuth, Resolution, and Accuracy**

ID	Sites	Requirements	
T 7-9.1	Mt. Ozzard	Minimum Detection Range	30 m
T 7-9.2		Minimum Range Resolution for small point targets	IALA 1111 Table 15, X-band, Advance
T 7-9.3		Minimum Range Accuracy for small point targets	IALA 1111 Table 17, X-band, Advance
T 7-9.4		Minimum Azimuth Resolution for small point targets	IALA 1111 Table 16, X-band, Advance
T 7-9.5		Minimum Azimuth Accuracy for small point targets	IALA 1111 Table 17, X-band, Advance
	Mt. Park, Bowen Island, Lévis, Île Charron, Eddy Point, Les Escoumins, and Port aux Basques and Point Edward, Site C, Site J		
T 7-9.6	Kap 100 , Berry Point, Site A, Site K	Minimum Detection Range	30 m
T 7-9.7		Minimum Range Resolution for small point targets	IALA 1111 Table 15, X-band, Standard
T 7-9.8		Minimum Range Accuracy for small point targets	IALA 1111 Table 17, X-band, Standard
T 7-9.9		Minimum Azimuth Resolution for small point targets	IALA 1111 Table 16, X-band, Standard
T 7-9.10		Minimum Azimuth Accuracy for small point targets	IALA 1111 Table 17, X-band, Standard
T 7-9.11	Chebucto Head, Georges Island, Shannon Hill, Partridge Island, and Pont Jacques Cartier, Site D	Minimum Detection Range	30 m
T 7-9.12		Minimum Range Resolution for small point targets	IALA 1111 Table 15, X-band, Basic
T 7-9.13		Minimum Range Accuracy for small point targets	IALA 1111 Table 17, X-band, Basic
T 7-9.14		Minimum Azimuth Resolution for small point targets	IALA 1111 Table 16, X-band, Basic
T 7-9.15		Minimum Azimuth Accuracy for small point targets	IALA 1111 Table 17, X-band, Basic



## 7.4 EXISTING SYSTEM DETAILS

7.4.1 The existing RADAR transceivers and existing antennas are described below. Table 7-10 is a summary of the RADAR transceivers per site and Table 7-11 lists the existing antennas per site.

**Table 7-10 Existing X-Band RADAR Transceivers**

Site	RADAR Model	Tx Peak Power	Rx Noise Figure
Arnolds Cove Cuslett Pearce Peak Île Charron Lévis	Raytheon Pathfinder R50	50 kW	6.5 dB
Port aux Basques Chebucto Head Georges Island Shannon Hill Partridge Island Eddy Point	Sperry Marine Decca Bridgemaster E 65608/A-E6	25 kW	5.0 dB
Red Head Tiverton	Canadian Marconi CMC CMR-91	25 kW	5.0 dB
Pont Jacques Cartier	Terma Scanter 2001	4-5 kW	3.5 dB
Point Edward	(Early) Terma Scanter 2001	25 kW	3.5 dB
Les Escoumins Mt. Ozzard Berry Point Kap 100 Bowen Island Mt. Helmcken Mt. Newton Mt. Parke	Terma Scanter 2001 F1 + F2	25 kW	3.5 dB

**Table 7-11 Existing Antennas** (All operating with horizontal polarization)

Site	Antenna Model (Note 1)	Gain (Size)	Antenna -3 dB H&V Beamwidth	Beam Shape
Arnolds Cove Cuslett Pearce Peak Île Charron <sup>3</sup> Lévis <sup>3</sup> Point Edward <sup>3</sup>	CHL SGX38.0H21-IC2	38 dBi (21')	0.36° Horizontal 11° Vertical	Inverse Cosecant Squared
Red Head Tiverton	EA 2526-67-DL	43.4 dBi (25')	0.36° Horizontal 2° Vertical	Fan
Port aux Basques <sup>3</sup> Chebucto Head <sup>3</sup> Georges Island <sup>3,4</sup> Shannon Hill Partridge Island <sup>3</sup> Eddy Point	Sperry Marine Decca Bridgemaster	31 dBi (8')	1.0° Horizontal 24° Vertical	Fan
Les Escoumins <sup>3</sup>	Terma 21' HG-HP-I-37	37 dBi (21')	0.36° Horizontal 11° Vertical	Inverse Cosecant Squared
Pont Jacques Cartier <sup>3</sup>	Terma 7' CO-HP-F-31	31 dBi (7')	1.10° Horizontal 16° Vertical	Fan
Mt. Ozzard Bowen Island Mt. Helmcken Mt. Parke	AIL Parabolic Reflector <sup>2</sup>	42 dBi (25')	0.29° Horizontal 5° Vertical	Inverse Cosecant Squared
Mt. Newton	AIL Parabolic Reflector <sup>2</sup>	43 dBi (32')	0.24° Horizontal 5° Vertical	Inverse Cosecant Squared
Berry Point <sup>3</sup> Kap 100 <sup>3</sup>	Decca (Model Unknown)	35 dBi (18')	0.42° Horizontal 16° Vertical	Fan

**Notes:**

1. X-Band frequency range 9.14 – 9.5 GHz.
2. The AIL antennas are mounted with a -3° tilt angle.
3. Shore-mounted RADAR, ≤ 0.1 NM (0.19 km) from the shore.
4. Georges Island is physically limited to a maximum antenna size of 8'. A mast-mounted RADAR transceiver cannot be used.

## 7.5 SHORE-MOUNTED RADAR

- 7.5.1 In addition to the specific range criteria listed in Tables 7-4 to 7-9 above, “shore-mounted” RADAR, which is defined as being located  $\leq 0.1$  NM (0.19 km) from the shore, must meet the following:
- 7.5.1.1 To a distance of 6 NM continuously for Long Range RADARs, and 2 NM for Medium and Short Range RADARs, without dropouts caused by nulls in the antenna vertical beam pattern (assumes an Inverse Cosecant Squared vertical antenna pattern);
  - 7.5.1.2 Without waveguide induced interference.
  - 7.5.1.3 At Georges Island, the maximum antenna size must be  $\leq 8'$ .
  - 7.5.1.4 At Georges Island, a mast-mounted RADAR transceiver must not be used.

## 7.6 SLANT RANGE CORRECTION

- 7.6.1 To maintain the accuracy of close-in detection, target range must be corrected for antenna slant range, by either the Transceiver or the Extractor, so that target range is recorded accurately with respect to the tower location (at mean sea level).

## 8 RADAR ANTENNA SYSTEM REQUIREMENTS

### 8.1 RADAR ANTENNA SYSTEMS

8.1.1 The X-Band Antenna Systems, both fixed panel and rotating, must meet the following requirements:

**Table 8-1 X-Band Antenna System requirements**

ID	Parameters	Value
T 8-1.1	Antenna Type*	<ul style="list-style-type: none"> <li>- 25' Parabolic antenna, or</li> <li>- 7' – 18' / 21' Slotted Waveguide antenna</li> </ul>
T 8-1.2	Frequency Band	X-band (within band 9.0 - 9.5GHz, as required to meet frequency diversity and other requirements)
T 8-1.3	Power handling	as required to meet transceiver transmit power and other requirements
T 8-1.4	Gain (dBi)	As required to meet requirements
T 8-1.5	Polarization	Horizontal
T 8-1.6		Switchable between Horizontal and Circular (Desirable) (This requirement is an option that must be included in the bid, see SOW Section 5.1.2)
T 8-1.7	Horizontal beamwidth @ -3 dB	As required to meet requirements
T 8-1.8	Vertical Pattern	As required to meet requirements
T 8-1.9	Vertical beamwidth @ -3 dB	As required to meet requirements
T 8-1.10	VSWR	$\leq 1.4:1$ (Desirable: $\leq 1.2:1$ )
T 8-1.11	Waveguide input	Standard UBR100 flanges preferred for WR90 waveguide; alternative flanges as required depending on specific design.
T 8-1.12	Motor power requirement*	3 phase, 208 VAC 60 Hz
T 8-1.13	Antenna rotation (@ 60Hz) in Revolution Per Minute (RPM)*	<ul style="list-style-type: none"> <li>- Variable RPM</li> <li>- Max RPM <math>\geq 15</math> (21' and 25' antennas)</li> <li>- Max RPM <math>\geq 24</math> (7' - 18' antennas)</li> </ul>
T 8-1.14	Dual Azimuth Encoders*	Each of the 2 azimuth encoders must produce at least 4096 Azimuth Change Pulses (ACP), and one Azimuth Reference Pulse (ARP), per antenna revolution.
T 8-1.15		The ARP accuracy must be 0.044 degree or better.
T 8-1.16	Mechanical lock of the antenna***	A mechanical lock to stop the antenna from turning during maintenance should be provided for personnel safety.

ID	Parameters	Value
		(Desirable) (This requirement is an option that must be included in the bid, see SOW Section 5.1.2)
T 8-1.17	Safety switch interlock	Required at the transmitter end, and at the antenna end, to shut down the motor and the transceivers for maintenance safety.
T 8-1.18	Lightning protection**	Lightning protection must be included in the design.
T 8-1.19	Temperature of operation (excluding cold start temperature)	-40° C to +55° C
T 8-1.20	Heating elements	As required to meet the temperature and ice specification.
T 8-1.21	Wind**	Operational: - to 160 km/hr (25' and 7' - 18' antennas) - to 190 km/hr (21' antenna)
T 8-1.22		Survival (free rotating): - 240 km/hr (25' antenna) - 250 km/hr (7' - 18' antenna) - 260 km/hr (21' antenna)
T 8-1.23	Ice Loading**	Operational: Must start up rotating* and continue operating without structural damage with up to: - 20 mm ice (25' and 21' antennas) - 12.7mm ice (7' - 18' antennas).
T 8-1.24		Survival (non-operational): - 30 mm ice (25' and 21' antennas) - 25.4mm ice (7' - 18' antennas).
T 8-1.25	Salt Fog**	Must meet MIL-STD-810G, Method 509.5 at 35°C, <b>OR</b> IEC-60068-2-52 as a minimum.

\* Not required if fixed panel.

\*\* This requirement doesn't apply to Mt Ozzard, as it has a radome.

\*\*\* This requirement is assumed to be met if fixed panel.

### 8.1.2 Wind or Ice Loading Shutdown

8.1.2.1 Rotating Antenna Systems must have an automatic shutdown feature under a programmable level of wind or ice loading.

8.1.2.2 Exceeding a wind or ice loading threshold must generate an appropriate alarm or contact closure, which must automatically inhibit the RADAR transmission.

- 8.1.2.3 Wind and Ice loading sensors must be provided with the supplied RADAR configuration.
- 8.1.2.4 The remote control facility must be capable of remotely restarting the RADAR Antenna system once the wind or ice loading condition has subsided.

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## 8.2 BUILT-IN SELF-TEST

### 8.2.1 Monitoring

- 8.2.1.1 Integrated Built-In Self-Test (BIST) functions for performance and operational monitoring must be a part of the RADAR Antenna System.
- 8.2.1.2 BIST must operate independently in the background and must initiate appropriate alarms when nominal operating parameters are determined to be beyond acceptable limits.
- 8.2.1.3 A list of Antenna System BIST functions must be provided.. The capabilities in Section 8.2.2 are typical of the level of monitoring that is expected.
- 8.2.1.4 BIST data must be available via the Transceiver Control Interface Windows application (see Section 9.9) and the RADAR Maintenance software tool (see Section 9.8).

### 8.2.2 Antenna System Status and Monitoring Points

Specific read-back signals from antennas may vary by make and manufacturer, so flexibility is required in order to accept and report on the variety of possible signals. The Antenna System read-back signals must provide the following functions as applicable:

- 8.2.2.1 Status of motor, gear and auxiliary inputs providing antenna states;
- 8.2.2.2 Status of operation (on, off, low, high speed);
- 8.2.2.3 Safety switch status;
- 8.2.2.4 Encoder power supply status;
- 8.2.2.5 Oil heater on or off;
- 8.2.2.6 High temperature alarm;
- 8.2.2.7 Low temperature alarm;
- 8.2.2.8 Low oil level;
- 8.2.2.9 Wind loading;
- 8.2.2.10 Ice loading.
- 8.2.2.11 Fixed panel arrays should have status read-back of critical functions as applicable.

### 8.2.3 Simple Network Management Protocol

- 8.2.3.1 The BIST results (Section 8.2) and the antenna system status and monitoring points (Section 8.2.2) must be available using SNMP v3 over an Ethernet interface.
- 8.2.3.2 The corresponding Management Information Base (MIB) information file must be provided to interface the antenna system SNMP output to the CCG support management console.

## 8.3 RELIABILITY AND MAINTAINABILITY

8.3.1 High reliability is required for these RADAR sites, and a fast maintenance response to the site may not always be possible.

### 8.3.2 Mean Time Between Failure and Availability

- 8.3.2.1 The Antenna System must operate 24hr/day, 365 days/year. Its operational availability must be 99.97% or better.
- 8.3.2.2 The Contractor must provide a RADAR Antenna System that has an overall MTBF of at least 120,000 hours. In the case of a rotating antenna, this figure includes the antenna, rotary joint, drive motor, encoders, controllers, inverters, and ancillary equipment.
- 8.3.2.3 The Contractor must state the Mean Time to Repair (MTTR) of the antenna system being proposed.
- 8.3.2.4 The Contractor must provide an explanation, (such as; empirical failure data, stress analysis, reliability test data, prediction calculation), of how their MTBF values were determined. (Note: MTBF calculations must be in accordance with MIL-HDBK-217F.)
- 8.3.2.5 For explanations based on empirical data, the Contractor must state the number of units used in the calculation, the number of hours of reliable service, the number of different types of failures recorded, the total number of failures, and any other information that can be used to evaluate the reliability claim of the equipment being offered.
- 8.3.2.6 Any rotating Antenna System must be capable of a minimum of 8,000 hrs of continuous operation without adjustments, lubrication or servicing, after the first year of operation.
- 8.3.2.7 For any rotating Antenna System, major maintenance activities including factory overhaul, must not be required until after a minimum of 70,000 hours of continuous operation.



## **9 RADAR TRANSCEIVER SPECIFICATIONS**

### **9.1 INTERFACE TO EXISTING EXTERNAL SYSTEMS**

- 9.1.1 The new RADAR transceivers must interface and be compatible with, the existing RADAR Antenna Systems (see Section 3.3.2).
- 9.1.2 The new RADAR transceivers must provide an available unused analogue interface with analogue video and trigger output as well as Azimuth output.

### **9.2 CONFIGURATION**

- 9.2.1 The RADAR transceivers must be capable of wall or tower mounting (where appropriate) including, waveguide switches, dummy loads, bi-directional couplers, maintenance displays and interconnection cables between units must be supplied.
- 9.2.2 Each X-Band transceiver must be able to operate independently from the other in case of a failure or during the maintenance. Each system must have its own circuitry and power supply.
- 9.2.3 The RADAR transceivers must be configured in redundant pairs such that in the event of a failure of the main RADAR, the back-up RADAR can be automatically or manually switched on-line locally at the RADAR transceiver equipment and remotely at the MCTS OCP and MCP.
- 9.2.4 The waveguide switch required for the dual X-Band configuration must inhibit the RF transmission during travel from one position to the other.

### **9.3 FREQUENCY DIVERSITY**

- 9.3.1 The RADAR transceiver must operate continuously with frequency diversity, and must have appropriate signal processing for improving S/N by correlating the RADAR returns at the frequencies used.
- 9.3.2 Squint compensation must be included, and the compensation strategy must be detailed.

### **9.4 TARGET TO CLUTTER IMPROVEMENT**

- 9.4.1 With reference to Section 9.3 above, the new RADAR transceiver must be fully coherent, utilizing pulse compression with Frequency Modulation (FM) techniques, Doppler processing, and advanced receiver and video processing.

## 9.5 FEATURES AND CONFIGURABLE PARAMETERS

9.5.1 For comparison purposes, the following pulse-type RADAR parameters are assumed:

9.5.1.1 Pulse Width (PW): 50 nanosecond (ns), 200 ns and 1000 ns (equivalent to short, medium and long pulses)

9.5.1.2 Pulse Repetition Frequency (PRF): 400 to 8000 pps.

9.5.2 For the pulse compression type of RADAR,

9.5.2.1 The modulated main pulse and the compression ratio must be such that a range resolution is achieved that would be equivalent to a range of pulse widths and PRFs as listed above within the limitation of the methods used.

9.5.2.2 Operationally, pulse compression settings may also be changed when clutter presents a performance limitation.

9.5.2.3 Optimum values of Chirp Duration and Chirp Repetition Frequency (CRF) must be calculated and implemented based on the site specific operating parameters.

9.5.3 The RADAR transceivers must be able to compensate for second time around returns in their processing.

9.5.4 RADAR signal digitization, must have a sampling rate sufficient to satisfy the Nyquist criteria, with the signal spectrum.

9.5.5 The RADAR video amplitude resolution must be 8-bit or better.

9.5.6 Auto-Adaptive Sensitivity Control

9.5.6.1 An Auto-Adaptive Sensitivity Control (ASC) or its equivalent must be included in order to improve the system capability in the areas of unequal distributed sea clutter.

9.5.6.2 It must be possible to turn off this function with the RADAR controls, at the operator's workstation.

9.5.7 Programmable Power Output Levels

The solid-state power amplifier (SSPA) output power must be sector gated such that the output power can be programmed for different power levels in different sectors from 0 (off) to maximum power.

9.5.8 Sea Clutter Discriminator

A Sea Clutter Discriminator capability must be included, in order to enhance the detection of extremely slow moving targets in clutter environments.

9.5.9 Logarithmic Video Output

The RADAR video amplitude must be logarithmic.

9.5.10 Spurious Artefacts

The RADAR receiver video output must be free of spurious artefacts caused by elements of the transceiver and its signal processing techniques. In particular, range side lobes or other self-generated clutter due to the use of pulse-compression

techniques must be suppressed by suitable filtering so that they do not compete with bona-fide targets nearby.

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## 9.6 RADAR TRANSCEIVER PERFORMANCE CHARACTERISTICS

9.6.1 The X-Band RADAR transceiver must meet the performance/function requirements provided in the following table:

**Table 9-1 RADAR Transceiver Performance**

ID	Parameter	Value
T 9-1.1	Frequency	X-band (within band 9.0 GHz – 9.5 GHz, as required to meet frequency diversity and other requirements)
T 9-1.2	Transmit Power	$\geq 50\text{W}$ , or as required to meet requirement
T 9-1.3	Pulse Compression Ratio	$\geq 500:1$
T 9-1.4	Duty Cycle (percentage)	$\leq 20\%$
T 9-1.5	RF Power Spectrum	The RADAR transmitters must meet the requirements of documents: ITU-R SM.329-10 and SM.1541-2, Annex 8.
T 9-1.6	Sectorized Transmission	Transmitter blanking and sectorized power levels must be programmable from 0 (off) to the Tx power stated above.
T 9-1.7		Number of sectors: $\geq 12$
T 9-1.8	Profiles	$\geq 10$ user defined profiles
T 9-1.9	Receiver Noise Figure (@ 25°C)	$\leq 3\text{ dB}$ maximum referenced from input flange of the transceiver.
T 9-1.10	Minimum Discernable Signal (MDS) figure	Better than -120 dBm equivalent after pulse compression.
T 9-1.11	Overall Dynamic Range	$\geq 100\text{ dB}$
T 9-1.12	Receiver Bandwidth	The Receiver bandwidth must be such that it accommodates extended pulses with frequency or phase modulation of various types.
T 9-1.13	Automatic Frequency Control	Automatic without operator intervention
T 9-1.14	Sensitivity Time Control (STC)	Provided
T 9-1.15	Power supply	120/208 VAC, 60 Hz (single phase).
T 9-1.16	Mechanical	Capable of wall or tower mounting where appropriate
T 9-1.17	RF Connector	WR90 (UBR100)

## 9.7 TRANSCEIVER VIDEO INTERFACE REQUIREMENTS

- 9.7.1 The RADAR transceiver must interface with the RADAR Extractor/Tracker.

## 9.8 RADAR MAINTENANCE AND INFORMATION DISPLAY

- 9.8.1 The Contractor must provide a dedicated computing resource and software tool, with at least a 17-inch display for RADAR maintenance and information display purposes at each RADAR site and in the equipment room at the associated MCTS Centre.
- 9.8.2 This computing resource must take the form of either physical computer (rack-mountable workstation / server, or embedded hardware in the Transceiver) or virtual machine.
- 9.8.3 The Contractor must provide a copy of the software tool installation package with unlimited distribution and usage rights that permits the CCG to install this software tool on any number of MS Windows, and optionally Linux, computers (GFEs).
- 9.8.4 The computing resource, software tool, and display at the MCTS Centres must be capable of controlling and monitoring each of the RADAR sites associated with that Centre, subject to available Government Furnished Equipment (GFE) communications links.
- 9.8.5 The computing resource and software tool must give remote access to the technician using a GFE network connection to any RADAR site associated with that MCTS Centre.
- 9.8.6 Network connection:
- 9.8.6.1 Physical interface: Ethernet IEEE 802.3
- 9.8.6.2 Link Protocol: TCP/IP
- 9.8.7 The computing resource, software tool, and display must be used for configuration, installation and/or maintenance purposes and must be co-located with the RADAR transceivers in the equipment building at remote sites, and in equipment rooms co-located with MCTS Centres.
- 9.8.8 The computing resource, software tool, and display must be capable of displaying the RADAR video, giving access to the system parameters for its configuration, and giving access to the RADAR controls and BIST alarms (as described in Section 9.11 and 9.12).
- 9.8.9 The software tool must allow for the selection of the ARP that corresponds to True North, independently of the optical encoder mechanical position. This is also called a remote alignment feature.

## 9.9 TRANSCEIVER CONTROL INTERFACE

- 9.9.1 In addition to the RADAR Maintenance and Informational Display software tool, the contractor must provide a MS Windows 7 and MS Windows 10 compatible application to be installed by CCG on Information System on Marine Navigation (INNAV) workstations.
- 9.9.2 The Contractor must provide a copy of the application installation package with unlimited distribution and usage rights that permits the CCG to install this software tool on any number of MS Windows 7 and MS Windows 10 computers (GFEs).
- 9.9.3 This MS Windows 7 and MS Windows 10 compatible application must provide the MCTS Operator with the following control and feedback capabilities through the Transceiver Control Interface.
- 9.9.4 RADAR Controls
- |         |   |                                    |
|---------|---|------------------------------------|
| 9.9.4.1 | RADAR Select:   | Main/Back-up, force failover       |
| 9.9.4.2 | Mode:   | On/Off/Standby (as applicable)     |
| 9.9.4.3 | Pulse Width (PW):   | Or equivalent                      |
| 9.9.4.4 | Antenna Polarization:   | Horizontal/Circular (If available) |
| 9.9.4.5 | Doppler/MTI:  | Select/Deselect                    |
| 9.9.4.6 | Gain:   |                                    |
| 9.9.4.7 | Fast Time Constant (FTC):                                       |                                    |
| 9.9.4.8 | Sensitivity Time Control (STC):                                 | Both automatic and manual          |
| 9.9.4.9 | Issue trigger signal to inhibit local RACONS (see Section 9.10) |                                    |
- 9.9.5 RADAR Feedback
- |         |                                   |                                |
|---------|-----------------------------------|--------------------------------|
| 9.9.5.1 | Mode:                             | On/Off/Standby (as applicable) |
| 9.9.5.2 | Pulse Width (PW):                 | Or equivalent                  |
| 9.9.5.3 | Minimum Range Alarm:              | PW too large for minimum range |
| 9.9.5.4 | Pulse Repetition Frequency (PRF): |                                |
| 9.9.5.5 | RADAR Output Power:               |                                |
| 9.9.5.6 | Transceiver Failure:              |                                |
- 9.9.6 RADAR Redundancy Controls
- |         |   |                           |
|---------|---|---------------------------|
| 9.9.6.1 | Hot/Cold/Standby Operation:               | Standby as applicable     |
| 9.9.6.2 | Manual switchover to standby transceiver: |                           |
| 9.9.6.3 | Automatic Switchover:                     | Upon primary unit failure |
| 9.9.6.4 | Wave Guide Switch Position                |                           |

## 9.10 TRIGGER SIGNAL TO INHIBIT A LOCAL RACON

- 9.10.1 This requirement is an option that must be included in the bid (see SOW Section 5.1.2). The RADAR system must be capable of generating a trigger output to inhibit a local RACON transponder within RADAR range.
- 9.10.2 This is for RACON transponders that can be activated by solid state pulse compression RADAR. Suppressing the RACON transmission for short periods on request will enable operational crews to check the RACON signal area for small targets. This trigger signal will be sent over a link that is not part of this specification.
- 9.10.3 The requirements for the trigger signal are as follows:
  - 9.10.3.1 The trigger signal must be generated (active) in a predefined azimuth sector. This sector must be configurable.
  - 9.10.3.2 The trigger signal must stay active during all the scan period of the predefined azimuth sector.
  - 9.10.3.3 A TTL level output or a logic level from 0 to 15 Volts is acceptable.
  - 9.10.3.4 The MCTS operators must be able to activate the RACON inhibit signal through the Transceiver Control Interface using the provided Windows application (see Section 9.9).

## 9.11 BUILT-IN SELF-TEST

- 9.11.1 Integrated Built-In Self-Test (BIST) functions for performance and operational monitoring of the X-Band RADAR transceivers must be supplied.
- 9.11.2 BIST must operate independently in the background and must initiate appropriate alarms when nominal operating parameters go beyond acceptable limits.
- 9.11.3 The following capabilities (see Section 9.12) are typical of the level of monitoring that is expected.
- 9.11.4 BIST data must be available via the Transceiver Control Interface Windows application (see Section 9.9) and the RADAR Maintenance software tool (see Section 9.8).

## 9.12 RADAR TRANSCEIVER BIST

- 9.12.1 The BIST for the RADAR Transceivers must include:
  - 9.12.1.1 Status of operation (TX1, TX2, on, off, standby, configuration parameters);
  - 9.12.1.2 RADAR-on Time and Solid State Power Amplifier Time-on;
  - 9.12.1.3 Monitoring of internal power supply voltages;
  - 9.12.1.4 Transceiver operating time;
  - 9.12.1.5 Low transmit power alarm (-1.5 dB is suggested as lower limit);
  - 9.12.1.6 Internal temperatures;

- 9.12.1.7 RF power sensing;
- 9.12.1.8 Remote interface status;
- 9.12.1.9 Cabinet functions (fans, high temperature);
- 9.12.1.10 Internal voltages of the receivers;
- 9.12.1.11 Internal temperature of the receivers;
- 9.12.1.12 Noise figure alarm;
- 9.12.1.13 Automatic Frequency Control (AFC) lock alarm;
- 9.12.1.14 Signal activity on trigger and video signals; and
- 9.12.1.15 Video signal level out of tolerance alarm.

## 9.13 SIMPLE NETWORK MANAGEMENT PROTOCOL

- 9.13.1 The Transceiver BIST results (Section 9.12) must be available using SNMP v3 over an Ethernet interface.
- 9.13.2 The corresponding MIB information file must be provided to interface the transceiver system SNMP output to the CCG support management console.

## 9.14 RELIABILITY AND MAINTAINABILITY

- 9.14.1 High reliability is required for these RADAR sites, and it must be presumed that a fast maintenance response to the site may not always be possible.
- 9.14.2 Mean Time Between Failure and Availability
  - 9.14.2.1 The RADAR Transceiver must operate 24hr/day, 365 days/year. The operational availability of the redundant transceivers must be 99.99% or better.  
*Note: Here, the associated availability model defines the system as a redundant (i.e., main and back-up) transceiver configuration.*
  - 9.14.2.2 The Mean Time Between Failures (MTBF) of a single transceiver within a RADAR configuration must be at least 20,000 hours.
  - 9.14.2.3 The Contractor must state the MTBF of the RADAR Transceiver being proposed.
  - 9.14.2.4 The Contractor must provide an explanation, (such as: empirical failure data, stress analysis, reliability test data, prediction calculation), of how their MTBF values were determined. (Note: MTBF calculations must be in accordance with MIL-HDBK-217F for a Ground Benign Environment of 25° C.)
  - 9.14.2.5 For explanations based on empirical data, the Contractor must state the number of units used in the calculation, the number of hours of reliable service, the number of different types of failures recorded, the total number of failures, and any other information which can be used to evaluate the reliability claim of the equipment.
  - 9.14.2.6 Where equipment is offered that has a soft-failure mode (as in the SSPA circuitry), this must be described, particularly as it affects the definition and calculation of MTBF.



### 9.14.3 Maintainability

- 9.14.3.1 The RADAR transceiver must allow the maintenance and repair of one unit while the other unit is in operation, in order to prevent a complete outage of the System. The design and the assembly must allow easy access to the various modules and their fast replacement.
- 9.14.3.2 An automated tool must be provided to enable a technician to reload all the software components in the system.
- 9.14.3.3 For any parameters that are stored in the RADAR component itself (memory, disk), a simple and/or automated backup and restore mechanism must be provided.
- 9.14.3.4 The Contractor must state the MTTR of the Transceiver being proposed.

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## 10 SAFETY, ENVIRONMENTAL AND APPROVAL OF EQUIPMENT

### 10.1 RADIATED EMISSIONS

- 10.1.1 The indoor equipment must meet the levels specified in Health Canada – Safety Code 6 (2015) “Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz”, or must meet IEC 61000-6-3 “Emission standard for residential environments”, or must meet ICNIRP guidelines “For limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)”.
- 10.1.2 The manufacturer must provide evidence (i.e., a test report) that the radiated emissions do not exceed the limits set out in Safety Code 6 (2015), Table 6, “Reference Levels for Electric Field Strength, Magnetic Field Strength and Power Density in Controlled Environments” for the frequency band 6,000-15,000 MHz, or in IEC 61000-6-3 “Emission standard for residential environments”, or in ICNIRP guidelines “Emission standard for residential environments”, or must meet ICNIRP guidelines “For limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)”.

### 10.2 ELECTRICAL SAFETY

#### 10.2.1 Safety Certification

In accordance with Paragraph 10.2.2 below, all RADAR transceivers must bear the appropriate certifying organization’s mark at the time of delivery to Canada.

#### 10.2.2 Electrical Safety Authority

The Electrical Safety Authority (ESA) recognizes certification bodies and field evaluation agencies, accredited by the Standards Council of Canada, to certify or evaluate electrical products or devices. Only equipment bearing a recognized mark or label is deemed to be approved for use in Canada. Information regarding recognized marks and labels approved for use in Canada can be found at:

[https://www.esasafe.com/assets/files/esasafe/pdf/Electrical\\_Product\\_Safety/ESA-ProductApprovalCard-Final-web.pdf](https://www.esasafe.com/assets/files/esasafe/pdf/Electrical_Product_Safety/ESA-ProductApprovalCard-Final-web.pdf)

#### 10.2.3 Personnel Safety Requirements

The RADAR transceiver equipment must incorporate the requirements specified above to provide for the safety of personnel engaged in installing, operating, and maintaining the equipment. It is recognized that equipment may include hazards. It is imperative that hazards be clearly identified and that measures be provided to protect personnel. In addition, the equipment must incorporate the following safety measures:

- 10.2.3.1 Electrical: The Transmitter Equipment must be designed to protect personnel from accidental contact with voltages in excess of 30 Volts, RMS or DC, during equipment operation.

- 10.2.3.2 Ground Potential: The Transmitter Equipment must be designed that all external parts, surfaces and shields are at ground potential during normal operation.
- 10.2.3.3 Grounding: The Transmitter Equipment grounding requirements must be supplied in accordance with the Electrical Safety Council and associated references, prior to delivery.
- 10.2.3.4 Guards and Barriers: The Transmitter Equipment contacts, terminals, and similar devices having voltages in excess of 70 Volts RMS or DC, with respect to ground, must have barrier guards to minimize accidental contact by personnel.
- 10.2.3.5 The Transmitter Equipment assemblies operating at potentials in excess of 300 Volts RMS or DC must be completely enclosed.
- 10.2.3.6 Interlock Switches: Interlock switches must be used in Transmitter Equipment cabinets that employ doors or cover plates to protect areas where lethal voltages, in excess of 300 Volts RMS or DC, are widely used or where the risk of exposure to high levels of non-ionizing radiation is present.
- 10.2.3.7 The interlock switch may be overridden by appropriate action of service personnel, but must return to its previous automatic function when the door or access panel is restored to the original position.
- 10.2.3.8 A safety switch interfaced to the antenna control circuits must interrupt electrical power to the antenna motor and also inhibit RF transmissions.

## 10.3 ENVIRONMENTAL CONDITIONS

### 10.3.1 Operational Conditions

All RADAR transceivers must meet all technical and operational requirements while operating under the following environmental conditions:

- 10.3.1.1 Ambient Temperature: -0° C to + 45° C (**Note**)
- 10.3.1.2 Relative Humidity: 90 % maximum at 40° C (non-condensing) (Desirable: 95% maximum at 45 °C)

**Note:** For mast-mounted RADAR Transceivers, the Ambient Temperature must be: - 40°C to +55°C.

### 10.3.2 Storage and Transportation

All RADAR transceivers must meet all technical and operational requirements following temporary storage or transportation under the following environmental conditions:

- 10.3.2.1 Ambient Temperature: - 40° C to + 70° C
- 10.3.2.2 Relative Humidity: 90 % maximum at 40° C (non-condensing) (Desirable: 95% maximum at 45 °C)

## 10.4 AC POWER TRANSIENTS AND INTERRUPTIONS

### 10.4.1 AC Power Transients

All RADAR transceivers must be designed to withstand voltage transients of  $\pm 25\%$  of nominal line voltage for a duration of 500 milliseconds.

### 10.4.2 Voltage Spikes

All RADAR transceivers must be designed to withstand voltage spikes of 1,000 Volts Peak for 10  $\mu$ seconds.

### 10.4.3 AC Power Restoration

Each RADAR transceiver must save its current configuration to non-volatile memory so that upon AC power restoration, it returns to its last valid configuration.

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EKME# 3614056

Canadian  
Coast Guard

Garde côtière  
canadienne

# ***RADAR Extractor/Tracker***



## ***Canadian Coast Guard***

### ***Technical Statement of Requirements***

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RADAR Extractor/Tracker TSOR

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2	April 20, 2017	Updated per LOI	LHG
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7	January 18, 2019	3rd Edition	JFC

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# 1 DOCUMENT MANAGEMENT

## 1.1 AUTHORITY

- 1.1.1 This document is issued by the Director General Integrated Technical Services (ITS), Canadian Coast Guard (CCG) National Technical Authority under the authority of the Deputy Minister Fisheries and Oceans and the Commissioner of the CCG, hereinafter known as “Canada”.

## 1.2 RESPONSIBILITY

- 1.2.1 The Technical Authority (TA) for the National RADAR Procurement Project, who resides in Electronics and Informatics (E&I) is responsible for:
- creation and promulgation of the document; and
  - identification of an Office of Primary Interest (OPI) who is responsible for the coordination and the content of the document.
- 1.2.2 The OPI is responsible for:
- validity and accuracy of the content;
  - availability of this information;
  - updates as needed;
  - periodic revision; and
  - follow-up of all requests, comments and/or suggestions received to the originator.

## 1.3 INQUIRIES AND/OR REVISIONS

- 1.3.1 All inquiries concerning this document, including suggestions for revision, and requests for interpretation, must be addressed to the OPI.

Position Title: National Project Manager

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- 1.3.2 All requests should:
- Be clear and concise.
  - Reference the specific Chapter, Section, or Table.

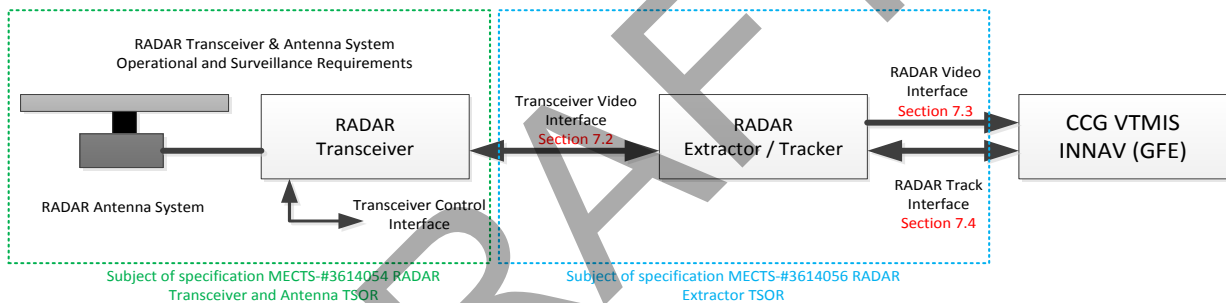
## 2 FOREWORD

### 2.1 PURPOSE

- 2.1.1 This document describes the technical requirements that must be met as a fundamental part of the normal procurement process documentation. The contents of this specification, when included by reference in any contract, must govern the acceptance of the system, through embodiment of the specification elements in performance tests.

### 2.2 SCOPE

- 2.2.1 This Technical Statement of Requirements (TSOR) establishes the technical requirements for the RADAR Extractor/Tracker and its interfaces. The high-level diagram below explains how the CCG RADAR procurement specifications are related to the overall project and which section refers to the identified component.



## **3 INTRODUCTION**

### **3.1 REQUIREMENTS**

- 3.1.1 Canada has a requirement to replace RADAR System Equipment including its Extractor/Trackers at its Marine Communications and Traffic Services (MCTS) RADAR sites.
- 3.1.2 The Extractor/Trackers will be replacing existing Extractors that are currently in use. The Extractor/Trackers must interface with and provide RADAR data to the CCG Vessel Traffic Management Information System (VTMIS), called Information System on Marine Navigation (INNAV).
- 3.1.3 In support of these goals, this specification defines the essential characteristics that are required for the Extractor/Trackers.
- 3.1.4 For the purposes of this TSOR, the Extractor/Trackers will be known as the “Extractors”.

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## 4 APPLICABLE DOCUMENTATION

### 4.1 SPECIFICATION AND PRECEDENCE

- 4.1.1 The following documents are applicable to this specification. In the case of a conflict between the wording elsewhere in this specification and the applicable documents, the CCG specification wording must take precedence.
1. RADAR Equipment Procurement Statement of Work (SOW), EKME# 3468591.
  2. RADAR Transceiver and Antenna TSOR, EKME# 3614054 (English).
  3. RADAR Extractor/Tracker TSOR, EKME# 3614056 (English).
  4. IALA Guideline 1111, Edition 1, May 2015, on “Preparation of Operational and Technical Performance Requirements for VTS Systems” This document is available at: <http://www.iala-aism.org/product/preparation-of-operational-and-technical-performance-for-vts-equipment/>
  5. IALA Recommendation V-125 in “The use and presentation of symbology at a VTS Centre (including AIS)”, Edition 3, June 2012. This document is available at: <http://www.iala-aism.org/product/use-and-presentation-of-symbology-at-a-vts-centre-including-ais-125/>
  6. IALA Recommendation V-145 on “the Inter-VTS Exchange Format (IVEF) Service”, Edition 1, June 2011. This document is available at: <http://www.iala-aism.org/product/inter-vts-exchange-format-service-145/>
  7. Department of Defence – MIL-HDBK-217F, “Reliability Prediction of Electronic Equipment”. This document is available at: [https://www.weibull.com/mil\\_std/mil\\_hdbk\\_217f.pdf](https://www.weibull.com/mil_std/mil_hdbk_217f.pdf)
  8. Electrical Safety Authority – Electrical Product Approval Requirements. This document is available at: [https://www.esasafe.com/assets/files/esasafe/pdf/Electrical\\_Product\\_Safety/ESA-ProductApprovalCard-Final-web.pdf](https://www.esasafe.com/assets/files/esasafe/pdf/Electrical_Product_Safety/ESA-ProductApprovalCard-Final-web.pdf)

## 5 LIST OF ACRONYMS AND INITIALISMS

AtoN	Aids to Navigation
BIST	Built-In Self-Test
C	Celsius
CCG	Canadian Coast Guard
CFAR	Constant False Alarm Rate
DC	Direct Current
E&I	Electronics & Informatics
ESA	Electrical Safety Authority
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ID	Identification
INNAV	Information System on Marine Navigation
IP	Internet Protocol
ITS	Integrated Technical Services
IVEF	Inter-VTS Exchange Format
kn	knots
Mbps	Megabits per second
MCTS	Marine Communications and Traffic Services
MIB	Management Information Base
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
NAS	Network-Attached Storage
OPI	Office of Primary Interest
P <sub>D</sub>	Probability of Detection
P <sub>FA</sub>	Probability of False Alarm
RMS	Root Mean Square
SNMP	Simple Network Management Protocol
SOG	Speed Over Ground
SOW	Statement of Work
TA	Technical Authority
TSOR	Technical Statement of Requirements
VTMIS	Vessel Traffic Management Information System
VTS	Vessel Traffic Services

## **6 EXTRACTOR PERFORMANCE AND FUNCTIONALITY**

### **6.1 PLOTS, FRAGMENTS, AND TARGETS**

- 6.1.1 It should be noted that the text below uses the term “plot” to define Extractor performance requirements. CCG defines a plot to be equivalent to a fragment (i.e., the smallest video unit handled by the Extractor). A target may be composed of multiple plots or fragments which are also referred to as plot aggregates.

### **6.2 GENERAL FEATURES**

- 6.2.1 The performance of the Extractor must not be the limiting factor for the whole RADAR system. In other words, the Extractor must be capable of processing all information contained in the transceiver raw video feed without imposing limits as to the amount of information that can be processed. The Extractor must process plots, fragments of plots, coast line reflection, waves and ice simultaneously if the Extractor is configured to do so, and the transceiver capacity and configuration allows for such targets to be detected.

### **6.3 DISPLAY AND CONFIGURATION**

- 6.3.1 The Contractor must include with each Extractor a solution for local Extractor configuration, maintenance and monitoring.
- 6.3.2 Extractor configuration, maintenance and monitoring must also be available remotely through the network Ethernet interface.

### **6.4 GEOGRAPHICAL PROCESSING**

- 6.4.1 Track handover from one Extractor’s coverage zone to another Extractor’s coverage zone, where overlapping coverage exists, is carried out by CCG VTMS.
- 6.4.2 The Extractor must be able to generate detailed land masks.
- 6.4.3 The Extractor must be able to generate video generation masks.
- 6.4.4 The Extractor must be able to support clutter mapping.
- 6.4.5 The Extractor must be able to support shadow areas.

### **6.5 BUILT-IN SELF-TEST**

- 6.5.1 The Extractor must have Built-In Self-Test (BIST) capability for internal diagnostics, error warnings and remote control, as a minimum.
- 6.5.2 The BIST must be configurable to run automatically, autonomously and at regular time intervals.
- 6.5.3 The BIST results must be available using Simple Network Management Protocol (SNMP) v3 over an Ethernet interface.
- 6.5.4 The Management Information Base (MIB) information file must be provided to interface the RADAR BIST SNMP output to the CCG support management console.

## 6.6 RELIABILITY AND MAINTAINABILITY

### 6.6.1 Mean Time Between Failures (MTBF)

- 6.6.1.1 The Extractor must have an MTBF of  $\geq 35,000$  hours
- 6.6.1.2 The Contractor must provide an explanation, (such as; empirical failure data, stress analysis, reliability test data, prediction calculation), of how their MTBF values were determined. (Note: MTBF calculations must be in accordance with MIL-HDBK-217F.)
- 6.6.1.3 For explanations based on empirical data, the Contractor must state the number of units used in the calculation, the number of hours of reliable service, the number of different types of failures recorded, the total number of failures, and any other information that can be used to evaluate the reliability claim of the equipment being offered.

### 6.6.2 Mean Time to Repair (MTTR)

The Extractor must have an MTTR of  $\leq 1$  hour

### 6.6.3 Rack Mountable

Extractor stand-alone components located at the remote site must be capable of being mounted in a standard 19" equipment rack.

### 6.6.4 Redundancy

The proposed Extractor solution must be configured to provide redundancy through active and standby units with automated switchover in case of failure. This configuration must avoid any single points-of-failure for the Extractors.



## 6.7 VIDEO PROCESSING

- 6.7.1 The Extractor must be capable of supporting frequency diversity.
- 6.7.2 The Extractor must maximize the signal-to-noise and signal-to-clutter ratio using such techniques as: Constant False Alarm Rate (CFAR), geographical masks, sweep integration, scan-to-scan correlation, and Sensitivity Time Constraints.
- 6.7.3 Target Representation

The Extractor must reproduce, on the RADAR video interface, the approximate shape of the RADAR target showing the outline and geometrical centre of the target.

## 6.8 PLOT EXTRACTION

- 6.8.1 Plot extraction from the video feed received on the Transceiver Video Interface must be automatic.
- 6.8.2 The plot extraction process must handle the minimum number of plots per rotation as shown in Table 6-1 below.

## 6.9 TRACK INITIATION

- 6.9.1 The Extractor must be able to be configured to initiate tracks automatically and manually, based on configured geographical zones in its configuration.
- 6.9.2 In automatic track initiation modes, all plot aggregates in a scan must be considered potential targets. Some of the plot aggregates will be associated with previously established tracks, with the remaining plots aggregates considered as candidates for new tracks, i.e., tentative tracks.
- 6.9.3 Tentative tracks must become confirmed tracks if plot aggregates from consecutive scans “fit into the picture” within reasonable physical manoeuvrability limits, otherwise the tentative tracks must be discarded.
- 6.9.4 The tracking system must be able to handle the tentative tracks, as detailed in Table 6-1.
- 6.9.5 The tracking system must initiate tracks and subsequently confirm tracks under certain conditions of Probability of Detection ( $P_D$ ) and Probability of False Alarm ( $P_{FA}$ ) or their equivalent.
- 6.9.6 It must also be possible to initiate a track manually from the CCG VTMIS using the RADAR Track Interface. In manual track initiation, a plot aggregate on the VTMIS display is selected by the operator using a graphical tool. When selected, this plot aggregate should form the starting point for a tentative track which eventually should be confirmed or discarded, as in the automatic case described above.

## 6.10 MAINTAINING TRACKS

- 6.10.1 If automatically or manually created tentative tracks persist over a certain length of time, the tracks must be promoted to confirmed tracks.
- 6.10.2 Confirmed tracks must be provided on the RADAR Track Interface to the CCG VTMIS.

- 6.10.3 The tracking system must be capable of handling the number of confirmed tracks specified in Table 6-1 and to maintain tracks until the track termination criteria are reached.

## **6.11 TRACK TERMINATION**

A confirmed track must be terminated if:

- 6.11.1 it moves outside the Extractor configured maximum range;
- 6.11.2 it moves into an Extractor configured defined non-tracking area;
- 6.11.3 the quality of the track falls below a predefined minimum configured in the Extractor;  
or
- 6.11.4 the track cannot be updated with new plots over a certain length of time configured in the Extractor.

## **6.12 TRACKING PERFORMANCE REQUIREMENTS**

- 6.12.1 The requirements in respect of plot extraction and tracking are defined by the individual MCTS authority, on the basis of local conditions, number of RADAR sensors in a system and other considerations.
- 6.12.2 The Extractor performance must meet the requirements shown in Table 6-1 below.

**Table 6-1 System Tracking Performance Requirements<sup>1</sup>**

	<b>Parameter</b>		<b>Requirement</b>
T6-1.1	Number of plots per antenna rotation <sup>2</sup>		$\geq 1000$
T6-1.2	Number of confirmed tracks		$\geq 500$
T6-1.3	Time for initiation of a tentative track		$\leq 1$ minute
T6-1.4	Time for classification as a confirmed track		$\leq 2$ minutes
T6-1.5	Time from data loss to automatic track termination		$\geq 60$ seconds
T6-1.6	Speed of tracked surface objects		$\leq 70$ knots (kn)
T6-1.7	Turn rate of tracked surface objects <sup>3</sup>		$\leq 20^\circ/\text{sec}$ with a SOG of $\leq 5$ kn
T6-1.8	Transversal acceleration of tracked objects <sup>3</sup>		$\leq 5 \text{ m/s}^2$ with a SOG of $> 5$ kn
T6-1.9	Accuracy of track position	Range RMS error (relative to sensor location)	As per IALA Guideline 1111, table 22, advanced RADAR sensor
T6-1.10		Bearing RMS error (relative to sensor location)	As per IALA Guideline 1111, table 22, advanced RADAR sensor
T6-1.11	Accuracy of track speed and direction	Speed over Ground RMS error	As per IALA Guideline 1111, table 22, advanced RADAR sensor
T6-1.12		Course over Ground RMS error	As per IALA Guideline 1111, table 22, advanced RADAR sensor

**Note 1:** Based on IALA Guideline 1111, "Preparation of Operational and Technical Performance Requirements for VTS Systems," Table 21 (Typical System Tracking Performance) and Table 22 (Single RADAR Sensor - Tracking Performance Parameters)

**Note 2:** Dependent upon area covered, traffic density and smallest size of objects to be tracked.

**Note 3:** The transversal acceleration – Speed Over Ground (SOG) turn rate, thus for slow moving targets, the turn rate is the limitation, whereas the transversal acceleration is the limitation for fast targets.

### 6.12.3 Track Initiation and Track Maintenance

- 6.12.3.1 The RADAR parameters impacting the  $P_D$  must be adaptable to the role of MCTS and configurable in each Extractor.
- 6.12.3.2 The automatic track initiation and track maintenance must be capable of being optimised in conjunction with the configuration of the parameters impacting the  $P_D$ .
- 6.12.3.3 Swapping of track identity may occur as a result of targets moving close together or merging for a period of time, especially if targets are overtaking with small difference in speed and course.
- 6.12.3.4 A simple method of manual correction must be available using the RADAR Track Interface.

### 6.12.4 False Tracks

- 6.12.4.1 The maximum number of false tracks allowed is dependent upon the role of the MCTS authority. It is necessary to avoid False tracks in safety critical areas and occasionally to be accepted in areas where surveillance and traffic monitoring is the priority.
- 6.12.4.2 There is a trade-off between the time for confirmation of a tentative track and the number of false tracks. A longer confirmation time implies fewer false tracks and it must be possible to balance this trade-off in each Extractor.
- 6.12.4.3 The confirmation time of tentative tracks must be configurable.

## **7 EXTRACTOR INTERFACES**

### **7.1 VIDEO INTERFACES**

- 7.1.1 The Extractors must interface and be compatible with the CCG VTMS System (which supports the RADAR display requirements) called INNAV through the RADAR Video Interface and the RADAR Track Interface.

### **7.2 TRANSCEIVER VIDEO INTERFACE**

- 7.2.1 For the newly delivered systems comprising the antenna, the transceiver and the Extractor, the interface between the transceiver and the Extractor is left to the contractor to define but must be documented and provided to CCG.
- 7.2.2 For any RADAR system, the Extractor may be located separately from the RADAR transceiver. The preference is to minimise the complexity of the equipment at the remote site.

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## 7.3 RADAR VIDEO INTERFACE

- 7.3.1 The RADAR video information for CCG VTMIS must come from the Extractor. This information must consist of Internet Protocol (IP) Network video (Streaming), using an Ethernet interface.
- 7.3.2 Digital Video Feed
- 7.3.2.1 Format: Video must be carried using the ASTERIX standard.
- 7.3.2.2 Video Shape: Polygon or other means must be used to represent targets as close as possible to “raw video” quality. Documentation must be provided on the video shape used to allow INNAV to decode and integrate the video feed entirely with its native quality.
- 7.3.2.3 Video Range Resolution: Must not degrade the resolution available from the Transceiver;
- 7.3.2.4 Video Azimuth Resolution: Must not degrade the resolution available from the Transceiver;
- 7.3.2.5 Video Amplitude: Must be  $\geq 8$  bits

## 7.4 RADAR TRACK INTERFACE

- 7.4.1 The RADAR track information for the CCG VTMIS must come from the Extractor using the Inter-VTS Exchange Format (IVEF) protocol standard or the ASTERIX protocol standard.
- 7.4.2 ASTERIX or IVEF RADAR track information must be provided over an Ethernet interface.
- 7.4.3 The Extractors must provide an interface for INNAV with the following track information, tracker control and feedback capabilities, (**Note:** Subject to the MCTS operational procedures, all of these functions might not be utilized.)
- 7.4.4 Track information
- 7.4.4.1 Format: Track information must be carried using the ASTERIX or the IVEF protocol standards.
- 7.4.4.2 Track information: Documentation must be provided on the track information, controls and feedback used by the Extractor to allow INNAV to decode and integrate the track feed entirely with its native quality.
- 7.4.5 Tracker Controls

The RADAR Track interface must offer the following controls:

- 7.4.5.1 Initialize and acquire masks
- 7.4.5.2 Acquire target
- 7.4.5.3 Release target
- 7.4.5.4 Auto Acquire (ON/OFF, minimum size, maximum speed (kn))

- 7.4.5.5 Gain control
- 7.4.5.6 Auto Tune Sensitivity Control
- 7.4.5.7 Clutter Control
- 7.4.5.8 Manual Tracks swap correction
- 7.4.6 Tracker Feedback

The RADAR Track interface must provide the following functions:

- 7.4.6.1 Mode: On/Off
- 7.4.6.2 Acquire target status indicator
- 7.4.6.3 Auto Tune Sensitivity level indicator
- 7.4.6.4 Clutter Control level indicator
- 7.4.6.5 Number of plots indicator
- 7.4.6.6 Number of targets indicator
- 7.4.6.7 Change of track ID notification

## **7.5 RADAR VIDEO RECORDING INTERFACE**

- 7.5.1 The Extractor must have an interface to enable the recording of raw video and track data to Network-Attached Storage (NAS) and local disk in the same format as described in 7.3 and 7.4 respectively.

## **7.6 RADAR SITE BANDWIDTH LIMITATION**

- 7.6.1 CCG RADAR remote sites are connected with different sized network links throughout the country. The available bandwidth for remote sites RADAR varies from 1Mbps to 100Mbps.
- 7.6.2 The RADAR system must be configurable so that the bandwidth used between remote site and MCTS centre does not exceed 1Mbps per RADAR in the most limited case.

## 8 SAFETY, ENVIRONMENTAL AND APPROVAL OF EQUIPMENT

### 8.1 ELECTRICAL SAFETY

#### 8.1.1 Safety Certification

- 8.1.1.1 In accordance with Paragraph 8.1.2.1 below, all Extractors must bear the appropriate certifying organization's mark at the time of delivery to Canada.

#### 8.1.2 Electrical Safety Authority

- 8.1.2.1 The Electrical Safety Authority (ESA) recognizes certification bodies and field evaluation agencies, accredited by the Standards Council of Canada, to certify or evaluate electrical products or devices. Only equipment bearing a recognized mark or label is deemed to be approved for use in Canada. Information regarding recognized marks and labels approved for use in Canada can be found at:

[https://www.esasafe.com/assets/files/esasafe/pdf/Electrical\\_Product\\_Safety/ESA-ProductApprovalCard-Final-web.pdf](https://www.esasafe.com/assets/files/esasafe/pdf/Electrical_Product_Safety/ESA-ProductApprovalCard-Final-web.pdf)

#### 8.1.3 Personnel Safety Requirements

- 8.1.3.1 The Extractor must incorporate the requirements specified above to provide for the safety of personnel engaged in installing, operating, and maintaining the equipment.
- 8.1.3.2 It is recognized that equipment may include hazards. Hazards must be clearly identified and measures must be provided to protect personnel.

In addition, the equipment must incorporate the following safety measures:

- 8.1.3.3 Electrical: The Extractor must be designed to protect personnel from accidental contact with voltages in excess of 30 Volts, RMS or DC, during equipment operation.
- 8.1.3.4 Ground Potential: The Extractor must be designed that all external parts, surfaces and shields are at ground potential during normal operation.
- 8.1.3.5 Guards and Barriers: The Extractor contacts, terminals, and similar devices having voltages in excess of 70 Volts RMS or DC, with respect to ground, must have barrier guards to minimize accidental contact by personnel.

### 8.2 ENVIRONMENTAL CONDITIONS

#### 8.2.1 Operational Temperature and Humidity

The provided equipment must operate in a continuous unattended mode under the following sheltered environmental conditions:

- 8.2.1.1 For equipment located at the remote site:
- Ambient Temperature: 0° C to +45° C
  - Relative Humidity: 90% maximum at 40° C (non-condensing)
- 8.2.1.2 For equipment located at the MCTS centre:
- Ambient Temperature: 5° C to +40° C



- Relative Humidity: 80% maximum at 40° C (non-condensing)

## **8.3 AC POWER TRANSIENTS AND INTERRUPTIONS**

### 8.3.1 Voltage Transients

- 8.3.1.1 The Extractors must be designed to withstand voltage transients of  $\pm 25\%$  of nominal line voltage for a duration of 500 milliseconds.

### 8.3.2 Voltage Spikes

- 8.3.2.1 The Extractors must be designed to withstand voltage spikes of 1,000 Volts Peak for 10  $\mu$ seconds.

### 8.3.3 AC Power Restoration

- 8.3.3.1 Extractors must save their current configuration to non-volatile memory so that upon AC power restoration, they return to their last valid configuration.

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## Integrated Technical Services



Safety First, Service Always



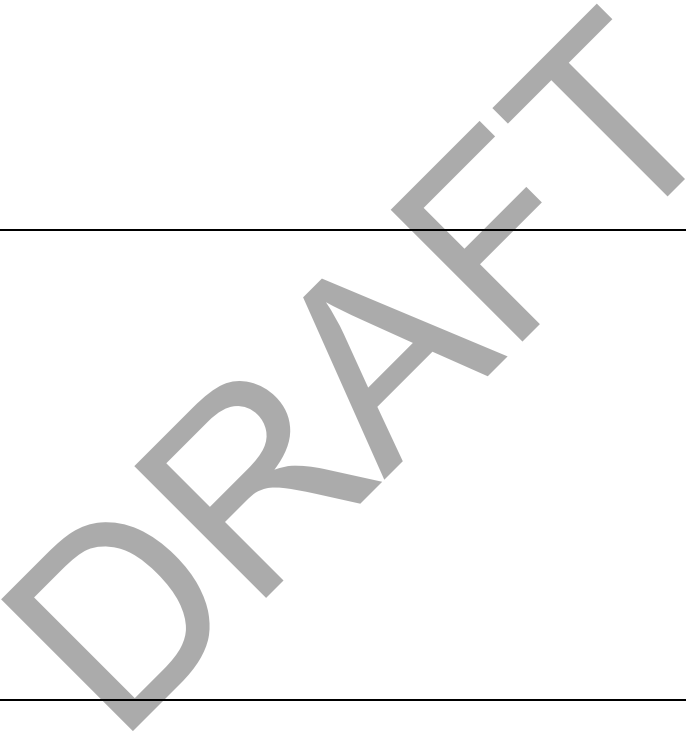
# Radar Equipment ITSG-33 Requirements

July 2017

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Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
1	AC 02	Account Management	<p>Does the system:</p> <p><b>a)</b> Automatically terminate temporary and emergency accounts? If so, after what period of time?</p> <p><b>b)</b> Automatically disable inactive accounts? If so, after what period of time?</p> <p><b>c)</b> Automatically audit account creation, modification, disabling, and termination actions and notify appropriate individuals?</p>		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
2	AC 03	Access Enforcement	Does the system enforce approved authorizations for access to the system?		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>
3	AC 06	Least Privilege	Does the system support the principle of least privilege, allowing only authorized accesses for users (or processes acting on behalf of users) which are necessary to accomplish assigned tasks?		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
4	AC 07	Unsuccessful Login Attempts Content	Does the system enforce a limit of consecutive invalid login attempts by a user?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system automatically lock the account /node for a period of time or lock the account /node until released by an administrator when the maximum number of unsuccessful attempts is exceeded? (This control applies for both local or network connection attempts)		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			If Yes, specify which method is used? If the first method is used for what period of time does the account remain locked?"		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
5	AC 08	System Use Notification	Can the system display an approved system use notification message or banner before granting access to the system? This message should provide privacy and security notices to the user.		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			If Yes, does the system retain the notification message or banner on the screen until users take explicit actions to log on to or further access the system?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
6	AC 09	Previous Logon/Access Notification	Does the system notify the user, upon successful logon/access, of the date and time of the last logon/access?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system notify the user, upon successful logon/access, of the number of unsuccessful logon/access attempts since the last successful logon/access?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system notify the user of the most recent successful or unsuccessful login/access attempts?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system notify the user of any security-related changes to the user’s account since the last successful login?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:



Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
7	AC 11	Session Lock	Does the system prevent further access to the system by initiating a session lock after period of inactivity or upon receiving a request from a user?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system retain the session lock until the user re-establishes access using established identification and authentication procedures?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system session lock mechanism (when activated on a device with a display screen) place a publicly viewable pattern onto the associated display, hiding what was previously visible on the screen?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
8	AC 14	Permitted Actions without Identification or Authentication	Does the system support actions/tasks without identification or authentication? If Yes, which actions/tasks are permitted?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
9	AC 17	Remote Access	Does the system support remote access? If Yes, how?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
10	AU 03	Content Of Audit Records	Does the system produce audit records that contain sufficient information to, at a minimum, establish what type of event occurred, when (date and time) the event occurred, where the event occurred, the source of the event, the outcome (success or failure) of the event, and the identity of any user/subject associated with the event?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
11	AU 05	Response To Audit Processing Failures	Does the system alert designated organizational officials in the event of an audit processing failure? Does the system take the following additional actions: shut down system, overwrite oldest audit records, and stop generating audit records? Does the system provide a warning when allocated audit record storage volume reaches 90% of maximum audit record storage capacity?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
12	AU 06	Audit Review, Analysis, And Reporting	Does the system integrate audit review, analysis, and reporting processes to support organizational processes for investigation and response to suspicious activities?		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>
13	AU 07	Audit Reduction and Report Generation	<div>Does the system provide an audit reduction and report generation capability?</div> <div>Does the system provide the capability to automatically process audit records for events of interest based on selectable event criteria?</div>		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
14	AU 08	Time Stamps	<p>Does the system use internal system clocks to generate time stamps for audit records?</p> <p>Does the system synchronize internal system clock at least daily with an authoritative time source?</p>		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
15	AU 09	Protection of Audit Information	Are there processes and procedures in place to protect audit information and audit tools from unauthorized access, modification, and deletion?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system back up audit records daily onto a different system or media than the system being audited?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor – reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
16	AU 10	Non-Repudiation	Does the system protect against an individual falsely denying having performed a particular action?		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>
17	AU 11	Audit Record Retention	Does the system provide audit record retention capability to provide support for after-the-fact investigations of security incidents?		<div><input type="checkbox"/> Compliant</div> <div><input type="checkbox"/> Partially Compliant</div> <div><input type="checkbox"/> Non Compliant</div> <div><input type="checkbox"/> Not Applicable</div> <div>Explanation:</div>

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
18	AU 12	Audit Generation	<p>Does the system provide audit record generation capability for a list of auditable events, such as time stamps, source and destination addresses, user/process identifiers, event descriptions, success/fail indications, filenames involved, and access control or flow control rules invoked?</p> <p>Does the system allow designated organizational personnel to select which auditable events are to be audited by specific components of the system?</p>		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
19	IA 02	Identification And Authentication (Organizational Users)	Does the system uniquely identify and authenticate the users (or processes acting on behalf of users)?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system use approved replay-resistant authentication mechanisms for network access to privileged accounts?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
			Does the system uniquely identify and authenticate devices before establishing a connection?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system use multifactor authentication for remote access to privileged accounts?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
20	IA 05	Authenticator Management	Does the system, for password-based authentication:  a) Enforce minimum password complexity of at least 8 characters with a mix of upper and lower-case letters, numbers, and special		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable



Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
			<p>characters?</p> <p><b>b)</b> Enforce at least a 50% change of characters when new passwords are created?</p> <p><b>c)</b> Encrypts passwords in storage and in transmission?</p> <p><b>d)</b> Enforces password minimum and maximum lifetime restrictions of 30 days for lifetime minimum, and 180 days for lifetime maximum?</p> <p><b>e)</b> Prohibits password reuse for 10 generations?</p>		Explanation:
			<p>Does the system, for PKI-based authentication:</p> <p><b>a)</b> Validate certificates by constructing a certification path with status information to an accepted trust anchor?</p> <p><b>b)</b> Enforce authorized access to the corresponding private key?</p> <p><b>c)</b> (c) Maps the authenticated identity to the user account?</p>		<p><input type="checkbox"/> Compliant</p> <p><input type="checkbox"/> Partially Compliant</p> <p><input type="checkbox"/> Non Compliant</p> <p><input type="checkbox"/> Not Applicable</p> <p>Explanation:</p>

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
21	IA 06	Authenticator Feedback	Does the system obscure feedback of authentication information during the authentication process to protect the information from possible exploitation/use by unauthorized individuals?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
22	IA 07	Cryptographic Module Authentication	Does the system use mechanisms for authentication to a cryptographic module?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
23	IA 08	Identification and Authentication Non-Organizational Users)	Does the system uniquely identify and authenticate non-organizational users (or processes acting on behalf of non-organizational users)?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
24	SA 05	Information System Documentation	Does documentation exist for the system that describes the following administrator information: <b>a)</b> Secure configuration, installation, and operation of the information system; <b>b)</b> Effective use and maintenance of security features/functions; <b>c)</b> Known vulnerabilities regarding configuration and use of administrative (i.e, privileged) functions.		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does documentation exist for the system that describes the following user information: <b>a)</b> User-accessible security features/functions and how to effectively use those security features/functions; <b>b)</b> Methods for user interaction with the information system, which enables individuals to use the system in a more secure manner; <b>c)</b> User responsibilities in maintaining the security of the information and information system.		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
			Does vendor/manufacture documentation exist for the system that describes the functional properties of the security controls employed within the information system with sufficient detail to permit analysis and testing?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does vendor/manufacture documentation exist for the system that describes the security-relevant external interfaces to the information system with sufficient detail to permit analysis and testing?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does vendor/manufacture documentation exist for the system that describes the high-level design of the information system in terms of subsystems and implementation details of the security controls employed within the system with sufficient detail to permit analysis and testing?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
			Are there procedures and processes in place to correct verifiable flaws, weaknesses and deficiencies identified during the security testing and evaluation process?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Are there procedures and processes in place to document the results of the security testing/evaluation and flaw remediation processes?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Is a regular vulnerability analysis performed and are any vulnerabilities, exploitation potential, and risk mitigations documented?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
25	SA 08	Security Engineering Principles	Do you apply information system security engineering principles in the specification, design, development, implementation, and modification of the information system?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
26	SC 24	Fail in Known State	Does the system fail to a known state in the event of a failure?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Not Applicable Explanation:
27	SI 04	Information System Monitoring	Does the system provide mechanisms for information system monitoring?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
			Does the system generate a unique session identifier for each session and recognize only session identifiers that are system-generated?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
			Does the system generate unique, random session identifiers?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
28	SC 24	Fail In Known State	Does the system fail to a known state preserving system state information in failure?		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:

Security Audit Controls for Protected A, Low and Low (PALL) Profile for Radar Equipment					
	ID	Control Name	What needs to be demonstrated	Response\Evidence from Vendor– reference capability where it exists and describe how proposed radar equipment and system configuration provides or supports this requirement	“For CCG Security Analysts Only”
29	SC 28	Protection Of Information At Rest	Does the system protect the confidentiality and integrity of information at rest? This control is intended to address the confidentiality and integrity of information at rest in non-mobile devices and covers user information and system information. Information at rest refers to the state of information when it is located on a secondary storage device (e.g., disk drive, tape drive) within an organizational system. Configurations and/or rule sets for firewalls, gateways, intrusion detection/prevention systems, and filtering routers and authenticator content are examples of system information likely requiring protection.		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:
30	SI 10	Information Input Validation	Does the system check the validity of information input? Rules for checking the valid syntax and semantics of system inputs (e.g., character set, length, numerical range, acceptable values) are in place to verify that inputs match specified definitions for format and content. Inputs passed to interpreters are pre-screened to prevent the content from being unintentionally interpreted as commands		<input type="checkbox"/> Compliant <input type="checkbox"/> Partially Compliant <input type="checkbox"/> Non Compliant <input type="checkbox"/> Not Applicable Explanation:





# Claim for Progress Payment Demande de paiement progressif

If necessary, use form PWGSC-TPSGC 1112 to record detail costs

Si nécessaire, utiliser le formulaire PWGSC-TPSGC 1112 pour inscrire les coûts détaillés

Contractor's Name and Address Nom et adresse de l'entrepreneur	Claim No. N° de la demande	Date YYYY-MM-DD / AAAA-MM-JJ	Contract Price - Prix contractuel
	File No. - N° du dossier		Contract Serial No. N° de série du contrat
Contractor's Procurement Business Number (PBN) Numéro d'entreprise-appvisionnement (NEA) de l'entrepreneur		Financial Code(s) - Code(s) financier(s)	

Contractor's Report of Work Progress (if needed, use additional sheets)

Compte rendu de l'avancement des travaux par l'entrepreneur (si nécessaire, utiliser des feuilles supplémentaires)

Period of work covered by the claim Période des travaux visée par la demande ▶	Current Claim Demande courante		Previous Claims Demandes précédentes		Total to Date Total à date
Description: (Expenditures must be claimed in accordance with the basis and/or method of payment of the contract) Description : (Les dépenses doivent être réclamées conformément à la base de paiement et (ou) à la méthode de paiement du contrat).	(A)	Tax Rate Taux de taxe	(B)	Tax Rate Taux de taxe	(A + B)
DRAFT		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
		%		%	
Contractor's GST No. N° de TPS de l'entrepreneur	Subtotal Sous-total				
Contractor's QST No. No. de TVQ de l'entrepreneur	Applicable taxes Taxes applicables				
Total					
Less holdbacks on expenditures only (Applicable taxes excluded) Moins les retenues sur les dépenses uniquement (Taxes applicables en sus)					
Total Amount of Claim (including applicable taxes) Montant total de la demande (incluant les taxes applicables)					
Percentage of the work completed Pourcentage des travaux achevés	%	Current Claim Demande courante	Amount due Montant dû		

Claim No.  
N° de la demande

Contract Serial No.  
N° de série du contrat

## CERTIFICATE OF CONTRACTOR

### I certify that:

- All authorizations required under the contract have been obtained. The claim is consistent with the progress of the work and is in accordance with the contract.
- Indirect costs have been paid for or accrued in the accounts.
- Direct materials and the subcontracted work have been received, accepted and either paid for or accrued in the accounts following receipt of invoice from supplier/subcontractor, and have been or will be used exclusively for the purpose of the contract.
- All direct labour costs have been paid for or accrued in the accounts and all such costs were incurred exclusively for the purpose of the contract;
- All other direct costs have been paid for or accrued in the accounts following receipt of applicable invoice or expense voucher and all such costs were incurred exclusively for the purpose of the contract; and
- No liens, encumbrances, charges or other claims exist against the work except those which may arise by operation of law such as a lien in the nature of an unpaid contractor's lien and in respect of which a progress payment and/or advance payment has been or will be made by Canada.

Contractor's Signature - Signature de l'entrepreneur

Check the box if the claim is being made with respect to advance payment provisions included in the basis of payment of the contract.

This claim, or a portion of this claim, is for an advance payment.

### I certify that:

- The funds received will be used solely for the purpose of the contract and attached is a complete description of the purpose to which the advance payment will be applied.
- The amount of the payment is established in accordance with the conditions of the contract.
- The contractor is not in default of its obligations under the contract.
- The payment is related to an identifiable part of the contractual work.

Contractor's Signature - Signature de l'entrepreneur

## CERTIFICATES OF DEPARTMENTAL REPRESENTATIVES

**Scientific/Project/Inspection Authority:** I certify that the work meets the quality standards required under the contract, and its progress is in accordance with the conditions of the contract.

**Inspection Authority (all other contracts):** I certify that the quality of the work performed is in accordance with the standards required under the contract.

Signature of Scientific / Project / Inspection Authority  
Signature de l'autorité scientifique ou responsable du projet / de l'inspection

**PWGSC Contracting Authority:** I certify that, to the best of my knowledge, the claim is consistent with the progress of the work and is in accordance with the contract. This claim, however, may be subject to further verification and any necessary adjustment before final settlement.

Contracting Authority Signature de l'autorité contractante

**Client's Authorized Signing Officer - (must sign the interim claim):** I certify that the claim is in accordance with the contract.

Client Signature du client

**Client's Authorized Signing Officer - (must sign the final claim):** I certify that all goods have been received and all services have been rendered, that the work has been properly performed and that the claim is in accordance with the contract.

Client Signature du client

## ATTESTATION DE L'ENTREPRENEUR

### J'atteste que :

- Toutes les autorisations exigées en vertu du contrat ont été obtenues. La demande correspond à l'avancement des travaux et est conforme au contrat.
- Les coûts indirects ont été réglés ou portés aux livres.
- Les matières directes et les travaux de sous-traitance ont été reçus, et le tout a été accepté et payé, ou encore porté aux livres après réception de factures envoyées par le fournisseur ou le sous-traitant; ces matières et ces travaux ont été ou seront utilisés exclusivement aux fins du contrat.
- Tous les coûts de la main-d'œuvre directe ont été réglés ou portés aux livres et tous ces coûts ont été engagés exclusivement aux fins du contrat.
- Tous les autres coûts indirects ont été réglés ou portés aux livres après réception des factures ou pièces justificatives pertinentes et tous ces coûts ont été engagés exclusivement aux fins du contrat.
- Il n'existe aucun privilège ni demande ou imputation à l'égard de ces travaux sauf ceux qui pourraient survenir par effet de la loi, notamment le privilège d'un entrepreneur non payé à l'égard duquel un paiement progressif et/ou un paiement anticipé a été ou sera effectué par le Canada.

Title - Titre

Date (YYYY-MM-DD / AAAA-MM-JJ)

Cocher la case si la demande est faite en rapport avec les dispositions relatives aux paiements anticipés qui se trouvent dans la base de paiement du contrat.

Cette demande, ou une partie de cette demande, est pour un paiement anticipé.

### J'atteste que :

- Les fonds reçus ne serviront uniquement qu'aux fins du contrat; ci-joint est une description complète des fins auxquelles le paiement anticipé sera utilisé.
- Le montant du paiement est établi conformément aux conditions du contrat.
- L'entrepreneur n'a pas manqué à ses obligations en vertu du contrat.
- Le paiement porte sur une partie identifiable des travaux précisés dans le contrat.

Title - Titre

Date (YYYY-MM-DD / AAAA-MM-JJ)

## ATTESTATIONS DES REPRÉSENTANTS DU MINISTÈRE

### Autorité scientifique ou responsable du projet / de l'inspection :

J'atteste que les travaux sont conformes aux normes de qualité exigées en vertu du contrat et que leur avancement est conforme aux conditions du contrat.

**Responsable de l'inspection (tous les autres contrats) :** J'atteste que la qualité des travaux exécutés est conforme aux normes exigées en vertu du contrat.

**Autorité contractante de TPSGC :** J'atteste, au meilleur de ma connaissance, que la demande correspond à l'avancement des travaux et est conforme au contrat. Toutefois, cette demande pourrait faire l'objet d'une autre vérification et de tout rajustement nécessaire avant le règlement final.

Title - Titre

Date (YYYY-MM-DD / AAAA-MM-JJ)

**Signataire autorisé du client - (doit signer la demande provisoire) :** J'atteste que la demande est conforme au contrat.

Title - Titre

Date (YYYY-MM-DD / AAAA-MM-JJ)

**Signataire autorisé du client - (doit signer la demande finale) :** J'atteste que tous les biens ont été reçus, que tous les services ont été rendus, que tous les travaux ont été exécutés convenablement, et que la demande est conforme au contrat.

Title - Titre

Date (YYYY-MM-DD / AAAA-MM-JJ)

## **ANNEX G**

### **TASK AUTHORIZATION PROCESS**

A Task Authorization Form PWGSC 572 (Annex G, Appendix A) shall be the work authorization mechanism for items on this contract.

Tasks shall be issued and authorized using the following process Services, Pricing Schedule A items 43 through 47, and for Additional Work that is not described in the Annex B Statement of Work but that is required to support the Radar Replacements and that would fall within the overall scope of the Work:

- (a) The Canadian Coast Guard (CCG) Technical Authority (TA) prepares a Statement of Work (SOW) describing the Work. The TA will e-mail the SOW directly to the Contractor with a c.c. to the PWGSC Contracting Authority (CA);
- (b) Upon receipt of the SOW, the Contractor shall provide the CA and the TA with a ceiling price to complete the task using, if applicable, the rates established in the Contract. The quote shall include the estimated turn-around time to complete the work as well as the cost;
- (c) The threshold for each tasking is \$25,000.00 CAD including taxes and amendments.
- (d) The TA and CA will review the proposal and decide whether or not to proceed with the Work;
  - a. Tasks over the threshold limit will be submitted to the CA for review and approval prior to release to the Contractor. The CA will forward the completed PWGSC 572 to the Contractor with a c.c. to the TA;
  - b. Tasks under the threshold limit will be signed by the TA and copies forwarded to the Contractor and the CA.
- (e) An amendment to the Task Authorization requires a revision to the PWGSC 572 Task Authorization Form;
  - a. If the amendment/revision is within the TA's delegation under the Contract (under \$25,000 CAD cumulative cost), the TA signs the amended PWGSC 572 and forwards copies to the Contractor and the CA;
  - b. If the amendment exceeds the TA's delegation under this Contract, the amended PWGSC 572 must be sent to the CA to be signed and furtherance to the Contractor;
- (f) The Contractor may not begin work before receiving the approved PWGSC 572 Task Authorization Form. Canada shall not be liable for any Work performed without a written and approved Task Authorization.

## Task Authorization Autorisation de tâche

**Instruction for completing the form PWGSC - TPSGC 572 - Task Authorization**  
*(Use form DND 626 for contracts for the Department of National Defence)*

**Instruction pour compléter le formulaire PWGSC - TPSGC 572 - Autorisation de tâche**  
*(Utiliser le formulaire DND 626 pour les contrats pour le ministère de la Défense)*

**Contract Number**

Enter the PWGSC contract number.

**Numéro du contrat**

Inscrire le numéro du contrat de TPSGC.

**Contractor's Name and Address**

Enter the applicable information

**Nom et adresse de l'entrepreneur**

Inscrire les informations pertinentes

**Security Requirements**

Enter the applicable requirements

**Exigences relatives à la sécurité**

Inscrire les exigences pertinentes

**Total estimated cost of Task (Applicable taxes extra)**

Enter the amount

**Coût total estimatif de la tâche (Taxes applicables en sus)**

Inscrire le montant

**For revision only**

**Aux fins de révision seulement**

**TA Revision Number**

Enter the revision number to the task, if applicable.

**Numéro de la révision de l'AT**

Inscrire le numéro de révision de la tâche, s'il y a lieu.

**Total Estimated Cost of Task (Applicable taxes extra) before the revision**

Enter the amount of the task indicated in the authorized TA or, if the task was previously revised, in the last TA revision.

**Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision**

Inscrire le montant de la tâche indiquée dans l'AT autorisée ou, si la tâche a été révisée précédemment, dans la dernière révision de l'AT.

**Increase or Decrease (Applicable taxes extra), as applicable**

As applicable, enter the amount of the increase or decrease to the Total Estimated Cost of Task (Applicable taxes extra) before the revision.

**Augmentation ou réduction (Taxes applicables en sus), s'il y a lieu**

S'il y a lieu, inscrire le montant de l'augmentation ou de la réduction du Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision.

**1. Required Work: Complete sections A, B, C, and D, as required.**

**1. Travaux requis : Remplir les sections A, B, C et D, au besoin.**

**A. Task Description of the Work required:**

Complete the following paragraphs, if applicable. Paragraph (a) applies only if there is a revision to an authorized task.

(a) Reason for revision of TA, if applicable: Include the reason for the revision; i.e. revised activities; delivery/completion dates; revised costs. Revisions to TAs must be in accordance with the conditions of the contract. See Supply Manual 3.35.1.50 or paragraph 6 of the Guide to Preparing and Administering Task Authorizations.

(b) Details of the activities to be performed (include as an attachment, if applicable)

(c) Description of the deliverables to be submitted (include as an attachment, if applicable).

(d) Completion dates for the major activities and/or submission dates for the deliverables (include as an attachment, if applicable).

**A. Description de tâche des travaux requis :**

Remplir les alinéas suivants, s'il y a lieu : L'alinéa (a) s'applique seulement s'il y a révision à une tâche autorisée.

(a) Motif de la révision de l'AT, s'il y a lieu : Inclure le motif de la révision c.-à.-d., les activités révisées, les dates de livraison ou d'achèvement, les coûts révisés. Les révisions apportées aux AT doivent respecter les conditions du contrat. Voir l'article 3.35.1.50 du Guide des approvisionnements ou l'alinéa 6 du Guide sur la préparation et l'administration des autorisations de tâches.

(b) Détails des activités à exécuter (joindre comme annexe, s'il y a lieu).

(c) Description des produits à livrer (joindre comme annexe, s'il y a lieu).

(d) Les dates d'achèvement des activités principales et (ou) les dates de livraison des produits (joindre comme annexe, s'il y a lieu).

---

**B. Basis of Payment:**

Insert the basis of payment or bases of payment that form part of the contract that are applicable to the task description of the work; e.g. firm lot price, limitation of expenditure, firm unit price

**C. Cost of Task:****Insert Option 1 or 2:****Option 1:**

Total estimated cost of Task (Applicable taxes extra): Insert the applicable cost elements for the task determined in accordance with the contract basis of payment; e.g. Labour categories and rates, level of effort, Travel and living expenses, and other direct costs.

**Option 2:**

Total cost of Task (Applicable taxes extra): Insert the firm unit price in accordance with the contract basis of payment and the total estimated cost of the task.

**D. Method of Payment**

Insert the method(s) of payment determined in accordance with the contract that are applicable to the task; i.e. single payment, multiple payments, progress payments or milestone payments. For milestone payments, include a schedule of milestones.

**B. Base de paiement :**

Insérer la base ou les bases de paiement qui font partie du contrat qui sont applicables à la description du travail à exécuter : p. ex., prix de lot ferme, limitation des dépenses et prix unitaire ferme.

**C. Coût de la tâche :****Insérer l'option 1 ou 2****Option 1 :**

Coût total estimatif de la tâche (Taxes applicables en sus) Insérer les éléments applicables du coût de la tâche établies conformément à la base de paiement du contrat. p. ex., les catégories de main d'œuvre, le niveau d'effort, les frais de déplacement et de séjour et autres coûts directs.

**Option 2 :**

Coût total de la tâche (Taxes applicables en sus) : Insérer le prix unitaire ferme conformément à la base de paiement du contrat et le coût estimatif de la tâche.

**D. Méthode de paiement**

Insérer la ou les méthode(s) de paiement établit conformément au contrat et qui sont applicable(s) à la tâche; c.-à.-d., paiement unique, paiements multiples, paiements progressifs ou paiements d'étape. Pour ces derniers, joindre un calendrier des étapes.

---

**2. Authorization(s):**

The client and/or PWGSC must authorize the task by signing the Task Authorization in accordance with the conditions of the contract. The applicable signatures and the date of the signatures is subject to the TA limits set in the contract. When the estimate of cost exceeds the client Task Authorization's limits, the task must be referred to PWGSC.

**3. Contractor's Signature**

The individual authorized to sign on behalf of the Contractor must sign and date the TA authorized by the client and/or PWGSC and provide the signed original and a copy as detailed in the contract.

---

**2. Autorisation(s) :**

Le client et (ou) TPSGC doivent autoriser la tâche en signant l'autorisation de tâche conformément aux conditions du contrat. Les signatures et la date des signatures appropriées sont assujetties aux limites d'autorisation de tâche établies dans le contrat. Lorsque l'estimation du coût dépasse les limites d'autorisation de tâches du client, la tâche doit être renvoyée à TPSGC.

**3. Signature de l'entrepreneur**

La personne autorisée à signer au nom de l'entrepreneur doit signer et dater l'AT, autorisée par le client et (ou) TPSGC et soumettre l'original signé de l'autorisation et une copie tel que décrit au contrat.

---



## Task Authorization Autorisation de tâche

Contract Number - Numéro du contrat

Contractor's Name and Address - Nom et l'adresse de l'entrepreneur	Task Authorization (TA) No. - N° de l'autorisation de tâche (AT)
	Title of the task, if applicable - Titre de la tâche, s'il y a lieu
	Total Estimated Cost of Task (Applicable taxes extra) Coût total estimatif de la tâche (Taxes applicables en sus) \$
Security Requirements: This task includes security requirements Exigences relatives à la sécurité : Cette tâche comprend des exigences relatives à la sécurité  No - Non      Yes - Oui      If YES, refer to the Security Requirements Checklist (SRCL) included in the Contract Si OUI, voir la Liste de vérification des exigences relative à la sécurité (LVERS) dans le contrat  ▶	

### For Revision only - Aux fins de révision seulement

TA Revision Number, if applicable Numéro de révision de l'AT, s'il y a lieu	Total Estimated Cost of Task (Applicable taxes extra) before the revision Coût total estimatif de la tâche (Taxes applicables en sus) avant la révision \$	Increase or Decrease (Applicable taxes extra), as applicable Augmentation ou réduction (Taxes applicables en sus), s'il y a lieu \$
--	--	---

**Start of the Work for a TA : Work cannot commence until a TA has been authorized in accordance with the conditions of the contract.**

**Début des travaux pour l'AT : Les travaux ne peuvent pas commencer avant que l'AT soit autorisée conformément au contrat.**

### 1. Required Work: - Travaux requis :

A. Task Description of the Work required - Description de tâche des travaux requis	See Attached - Ci-joint
B. Basis of Payment - Base de paiement	See Attached - Ci-joint
C. Cost of Task - Coût de la tâche	See Attached - Ci-joint
D. Method of Payment - Méthode de paiement	See Attached - Ci-joint

Contract Number - Numéro du contrat

## 2. Authorization(s) - Autorisation(s)

By signing this TA, the authorized client and (or) the PWGSC Contracting Authority certify(ies) that the content of this TA is in accordance with the conditions of the contract.

En apposant sa signature sur l'AT, le client autorisé et (ou) l'autorité contractante de TPSGC atteste(nt) que le contenu de cette AT respecte les conditions du contrat.

The client's authorization limit is identified in the contract. When the value of a TA and its revisions is in excess of this limit, the TA must be forwarded to the PWGSC Contracting Authority for authorization.

La limite d'autorisation du client est précisée dans le contrat. Lorsque la valeur de l'AT et ses révisions dépasse cette limite, l'AT doit être transmise à l'autorité contractante de TPSGC pour autorisation.

\_\_\_\_\_  
Name and title of authorized client - Nom et titre du client autorisé à signer

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
PWGSC Contracting Authority - Autorité contractante de TPSGC

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## 3. Contractor's Signature - Signature de l'entrepreneur

\_\_\_\_\_  
Name and title of individual authorized - to sign for the Contractor  
Nom et titre de la personne autorisée à signer au nom de l'entrepreneur

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## ANNEX H

### FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY - CERTIFICATION

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit [Employment and Social Development Canada \(ESDC\)-Labour's](#) website.

Date: \_\_\_\_\_ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

- ☐ A1. The Bidder certifies having no work force in Canada.
- ☐ A2. The Bidder certifies being a public sector employer.
- ☐ A3. The Bidder certifies being a [federally regulated employer](#) being subject to the [Employment Equity Act](#).
- ☐ A4. The Bidder certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

- ☐ A5.1. The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with ESDC-Labour.

**OR**

- ☐ A5.2. The Bidder certifies having submitted the [Agreement to Implement Employment Equity](#) (LAB1168) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

- ☐ B1. The Bidder is not a Joint Venture.

**OR**

- ☐ B2. The Bidder is a Joint Venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)



**RADAR EQUIPMENT PROCUREMENTS STATEMENT OF WORK**

All Bidders must submit a completed RADAR Equipment Procurements Bid Evaluation Matrix.

This Matrix provides a list of items (headings and subheadings) contained in the specified documents. Each requirement is listed. All proposals shall be reviewed using this Matrix. Bidders must annotate if Mandatory items are COMPLIANT OR NON-COMPLIANT.

It is the Bidders’ responsibility to provide in their proposals clear references to the proof of compliance for mandatory requirements (e.g. section and page number, where the information can be located in their documentation). For INFORMATION items, the Bidders should indicate ‘UNDERSTOOD’. Failure to do so does not remove the obligation of the bidder to understand and comply with the requirement when performing the work under any resultant contract. If only a heading or subheading is used, the Bidders’ proposals must comply with all requirements detailed under this heading including all sub headings and sub-sub headings etc. Any additional details for a particular section included under the COMMENTS is intended to specify particular details that must be included over and above general information to support bidders’ statement of compliance.

The column titled “Compliance Demonstration Method” indicates the minimum required for demonstrating Bid compliance with a mandatory or desirable requirement. Only the Compliance Demonstration Methods (indicated in the Compliance Matrix by the following letter codes) are acceptable for supporting a Bidder’s claim of compliancy for each of the requirements:

Table 1 Mandatory Requirements

Letter	Compliance Demonstration Method
“A”	The Bidder must provide a compliance statement to clearly agree that the stated work will be completed, or that the stated requirement will be met.
“D”	The Bidder must provide details as to how the work will be undertaken, or how the stated requirement will be met.
“W”	The Bidder must include the requested information with the Bid.
“S”	The Bidder must provide product specifications, manuals, or other published documentation that demonstrates that the solution(s) proposed fully complies with the requirement.
“M”	The Bidder must provide analysis or simulation predicting the performance of solution(s) proposed, that demonstrates full compliance with the requirement.

“T”	The Bidder must provide test results or documented performance of existing equipment proposed, that demonstrates full compliance with the requirement.
“N/A”	Compliance Demonstration not applicable or not required.

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1.0	Document Management	I					
2.0	Scope	Title					
2.1	Purpose	Title					
2.1.1	Purpose of this SOW	I					
2.1.2	RADAR system	I					
2.1.3	RADAR Equipment	I					
2.1.4	Integration	I					
2.1.5	Requirements	I					
2.1.6	SOW Document Organization	I					
2.1.7	ITSG-33 Compliance Work Items	I					
2.1.8	Equipment to operate with existing antenna systems at 5 locations	I					
2.1.9	RADAR System	I					
2.2	General Operational Concept and Intended Use of Equipment	Title					
2.2.1	Mandate and Mission	I					

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2.2.2	Equipment Operation and Availability	I					
2.2.3	CCG ITS Directorate	I					
2.3	Acquisition Approach	Title					
2.3.1	Requirements RADAR	I					
2.3.2	RADAR Equipment Delivery	I					
2.3.3	RADAR Equipment Delivery schedule	I					
2.3.4	CCG Deployment and installation	I					
2.3.5	Compliance with SOW	I					
2.4	Terminology	Title					
2.4.1	Terms	I					
3.0	Applicable Documentation	Title					
3.1	Documents stipulating work requirements	M	A				
3.1.1	RADAR Equipment Procurement SOW	M	A				
3.1.2	RADAR Transceiver and Antenna TSOR	M	A				
3.1.3	RADAR Extractor/Tracker TSOR	M	A				
3.1.4	RADAR Equipment ITSG-33 Requirements	M	A				
3.1.5	ITSG-33	M	A				
3.1.6	Quality Management (QM) Configuration Management (CM) Test Eqpt. Calibration Requirements.	M	A				

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3.1.7	Canadian Environmental Protection Act	M	A				
3.1.8	Environmental Management Systems, ISO 14001:2015	M	A				
3.1.9	Hazardous Products Act	M	A				
3.1.10	Transportation of Dangerous Goods Act	M	A				
3.1.11	Nuclear Safety and Control Act	M	A				
3.1.12	RF Exposure Guidelines, Safety Code 6	M	A				
3.1.13	Pest Control Products Act	M	A				
4.0	Deliverables	Title					
4.1	Equipment Delivery	Title					
4.1.1	RADAR Equipment Delivery in General	Title					
4.1.1.1	COTS and field proven	M	D				
4.1.1.2	Have previous experience	M	W				See Rated Requirements.
4.1.1.3	Names and Contact info for VTS experience	M	W				See Rated Requirements.
4.1.1.4	Dates and Durations for VTS experience	M	W				See Rated Requirements.
4.1.1.5	Names and Contact info for VTMISS integration experience	M	W				See Rated Requirements.
4.1.1.6	Dates and Durations for VTMISS integration experience	M	W				See Rated Requirements
4.1.2	RADAR Equipment Delivery Schedule	Title					

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4.1.2.1	RADAR Equipment Delivery Schedule	D	D				See Rated Requirements.
4.1.2.2	RADAR Equipment Delivery Schedule	D	D				See Rated Requirements.
4.1.3	RADAR Equipment Quantities	Title					
4.1.3.1	Quantity of 68 RADAR Transceivers	M	A				
4.1.3.2	Quantity of 2 RADAR Transceivers for CCG Test Lab	M	A				
4.1.3.3	Quantity of 2 RADAR Transceivers for CCG College	M	A				
4.1.3.4	Estimated quantity of 5 spare RADAR Transceivers	M	A				
4.1.3.5	Sparing for RADAR Transceivers	M	A				
4.1.3.6	Quantities as required for RADAR Extractor set components	M	A				
4.1.3.7	Quantity of 1 RADAR Extractor components for CCG Test Lab	M	A				
4.1.3.8	Quantity of 1 RADAR Extractor components for CCG College	M	A				
4.1.3.9	Estimated quantity of 5 RADAR Extractor components	M	A				
4.1.3.10	Sparing for RADAR Extractor components	M	A				

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4.1.3.11	Quantity of 31 or 36 Antenna Systems	M	A				
4.1.3.12	Estimated quantity of 8 Antenna Systems	M	A				
4.1.3.13	Sparing for RADAR Antenna Systems	M	A				
4.1.3.14	Quantity of additional display / computing equipment as necessary	M	A				
4.1.4	RADAR Equipment Independent Software Applications	Title					
4.1.4.1	Provide Application Installation Package	M	A				
4.1.5	RADAR Equipment Maintenance, Sparing and Spares	Title					
4.1.5.1	Forecasted equipment service life is 20+ years	I					
4.1.5.2	CCG repair and replacement strategy	I					
4.1.5.3	List of recommended spares	M	A				
4.1.5.4	Provide a Recommended Spare Parts List and schedule to support the system for 20 years	M	A				
4.1.5.5	RADAR equipment maintenance strategy	I					
4.1.5.6	Analysis to support sparing recommendations	M	A				
4.1.5.7	Present analysis at SPM	M	A				
4.1.5.8	CCG to determine what sparing equipment will be purchased	I					

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4.1.5.9	Delivery of RADAR Equipment sparing equipment	M	A				
4.1.5.10	Estimated quantities as a placeholder for spares	I					
4.1.6	Preservation, Packaging, Packing, Marking	Title					
4.1.6.1	Deliver all equipment according to Supply Plan	M	A				
4.1.7	Asset Management System Data	Title					
4.1.7.1	CCG uses an AMS	I					
4.1.7.2	Provision of AMS data	M	A				
4.1.7.3	Use of an MS Excel template to provide AMS data	M	A				
4.2	Integration and Installation	Title					
4.2.1	Integration with Existing Equipment	Title					
4.2.1.1	Capable of integration	M	D				
4.2.1.2	For equipment and interfacing	M	A				
4.2.2	INNAV Interface Development Support	Title					
4.2.2.1	Contractor to plan for support	M	A				
4.2.2.2	Description of interface support required	M	A				
4.2.3	Installation Service Report	Title					
4.2.3.1	Contractor to plan for up to 5 days for on-site installation support for each location	M	A				

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4.2.3.2	Baselined schedule to be reviewed.	M	A				
4.2.4	CCG Test Laboratory Installation	Title					
4.2.4.1	Delivered and install RADAR Equipment	D	A				
4.2.4.2	Delivered and install RADAR Equipment	M	A				
4.2.4.3	Connected to CCG OpNet	M	A				
4.2.4.4	Use CCG provided IP addresses and naming convention	M	A				
4.2.4.5	CCG Network Time Protocol	M	A				
4.2.4.6	Anti-virus	M	A				
4.2.5	CCG College Installation	Title					
4.2.5.1	Deliver RADAR Equipment	D	A				
4.2.5.2	RADAR Equipment installed by CCG	I					
4.2.6	Site Installation, On-Site Inspections and SATs	Title					
4.2.6.1	Provision of installation service support	M	A				
4.2.6.2	Finalization of an installation schedule	M	A				
4.2.6.3	Development of an Installation Plan	M	A				
4.2.6.4	Provision of on-site inspections	M	A				
4.2.6.5	Verification of installation and configuration	M	A				
4.2.6.6	Perform pre-testing	M	A				
4.2.6.7	Complete preliminary system optimization	M	A				



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4.2.6.8	SATs completed following on-site inspections	M	A				
4.2.6.9	Provision of final “as-built” drawings following successful SATs	M	A				
4.2.6.10	Service Support within 3 days of installation	M	D				
4.2.6.11	Physical installations completed by CCG	I					
4.2.6.12	Connected to CCG OpNet	M	A				
4.2.6.13	Respect CCG IP addresses and naming conventions	M	A				
4.2.6.14	CCG Network Time Protocol	M	A				
4.2.6.15	Anti-virus	M	A				
4.2.7	Site Access	Title					
4.2.7.1	Communication of on-site work hours	M	A				
4.2.7.2	On-site access arranged by and coordinated through CCG	I					
4.2.7.3	Use of CCG property to be kept in good order	I					
4.2.8	Field Support Services	Title					
4.2.8.1	Continuity of installation support	M	A				
4.2.8.2	Work defined	I					
4.2.8.3	Provision of trip reports for field support service call-ups	M	A				

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4.3	Documentation and Data	Title					
4.3.1	General	Title					
4.3.1.1	Documentation – format according to appendix C	M	A				
4.3.1.2	Documentation – in CDRL according to DIDs	M	A				
4.3.1.3	Documentation	M	A				
4.3.1.4	Initial documentation	M	A				
4.3.1.5	Submission locations	M	A				
4.3.1.6	Documentation requirements	I					
4.3.1.7	CCG reviews	I					
4.3.1.8	Documentation revisions	M	A				
4.3.1.9	Documentation submitted in French	M	A				
4.3.1.10.	CCG reviews	I					
4.3.1.11	Final documentation in English & French	M	A				
4.3.1.12	Configuration control processes	M	D				
4.3.2	Project Management Plan	Title					
4.3.2.1	Provide and maintain a PMP, WBS and MPS	M	W				
4.3.2.2	Provide a Risk Management Plan	M	W				
4.3.2.3	Risk Management Plan may be a subset of PMP	I					
4.3.2.4	Implement a Risk Register	M	W				
4.3.2.5	PMP baseline 10 days follow Project Kick-Off	M	A				

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4.3.2.6	Manage the Project	M	A				
4. 3. 2.7	Changes recorded relative to the starting baseline	M	A				
4. 3. 2.8	Change management process	M	A				
4. 3. 2.9	CMP used to manage changes	M	W				
4. 3. 2.10	CRs used to manage changes	M	A				
4. 3. 2.11	Configuration management	M	A				
4. 3. 2.12	Use of clarification requests	M	A				
4.3.3	Project Progress Reports	Title					
4.3.3.1	Provide Project Progress Reports	M	A				
4.3.3.2	Monthly project progress meetings	M	A				
4.3.3.3	Schedule may be amended	I					
4.3.3.4	PPRs	M	A				
4.3.3.5	Delays and forecasted problems	M	A				
4.3.3.6	PPRs	M	A				
4.3.3.7	Format	M	A				
4.3.4	Technical Publications	Title					
4.3.4.1	Supply and deliver all technical publications	M	W				
4.3.4.2	Technical Publications	I					
4.3.4.3	INNAV interface development documentation	M	W for COTS				

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4.3.4.4	Repair Schemes	M	A				
4.3.5	Maintenance Plan	Title					
4.3.5.1	Provide maintenance plans as per DIDs MM-04 and MM-05 and MM-06 (Calibration Requirements Report)	M	A				
4.3.5.2	Maintenance plan as per technical specifications	M	A				
4.3.5.3	Maintenance tasks performed to the LRU	M	A				
4.3.5.4	Identifies all items to perform and complete tasks	M	A				
4.3.5.5	To include sparing section	M	A				
4.3.6	Equipment Manual	Title					
4.3.6.1	Provide an Equipment Manual in Accordance with DID TDM-06	M	A				
4.3.6.2	Equipment Manual	I					
4.3.7	System Manual	Title					
4.3.7.1	Provide a System Manual in Accordance with DID TDM-05	M	A				
4.3.7.2	System Manual	I					
4.3.8	Software Documentation	Title					
4.3.8.1	Software user manual (DID TDM-08)	M	A				
4.3.8.2	Software version controls (DID TDM-07)	M	A				

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4.3.8.3	Documentation incorporated into System and Equipment Manuals	I					
4.3.9	Training Plan	Title					
4.3.9.1	Training Plan for technical and operational courses	M	A				
4.3.9.2	Operational portion of Training Plan	M	A				
4.3.9.3	Technical portion of Training Plan	M	A				
4.3.9.4	Training Plan draft within 20 days of Project Kick-Off Meeting	M	A				
4.3.9.5	Accordance with DID TT-02 and TT-03	M	A				
4.3.9.6	Training Plan draft outlines training courseware and instructor package	M	A				
4.3.9.7	Completion training materials following Training Plan approvals	M	A				
4.3.10	Training Course Material	Title					
4.3.10.1	Accordance with TT-03	M	A				
4.3.10.2	Approved by CCG	M	A				
4.3.10.3	Technical Training Package	M	A				
4.3.10.4	Operational Training Package	M	A				
4.3.11	Test Plans and Procedures	Title					

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4.3.11.1	Test Plans for FATs, INNAV interface verification and SATs	M	A				
4.3.11.2	Use of INNAV Display	M	A				
4.3.11.3	Test Procedures for FATs and SATs	M	A				
4.3.11.4	Test Procedures based on TSORs, ITSG-33 requirements and SOW	M	A				
4.3.11.5	FAT documentation drafts prior to FRR	M	A				
4.3.11.6	SAT Test Plans and Procedures drafts prior to IRR	M	A				
4.3.11.7	Testing Schedule included in MPS	M	A				
4.3.12	Installation Drawings and Instructions	Title					
4.3.12.1	Installation Drawings and Instructions for 34 remote sites, the CCG College and CCG Test Lab	M	A				
4.3.12.2	Inclusion of System Optimization Plan for each remote site	M	A				
4.3.12.3	IRR packages contains 3 printed and 1 e-copy.	M	A				
4.3.12.4	French translations for St. Laurent sector sites.	M	A				
4.3.12.5	Installation Package	M	A				
4.3.12.6	Initial IRR Installation Drawings and Instructions	M	A				
4.3.12.7	Post IRR Installation Drawings and Instructions	M	A				

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	update						
4.3.12.8	Installation Drawings and Instructions	M	A				
4.3.13	ITSG-33 Security Compliance	Title					
4.3.13.1	ITSG-33 Security Compliance	M	A				
4.3.13.2	ITSG-33 Capabilities Development Plan	M	A				
4.3.13.3	Submit with the bid the completed ITSG-33 RADAR Equipment Requirements Document	M	W				
4.3.13.4	Inform Contractor of ITSG-33 non-compliances	I					
4.3.13.5	Present resolutions to ITSG-33 non-compliances	M	A				
4.3.13.6	Present ITSG-33 compliance and mitigations plan to ITSG-33 non-compliances	M	A				
4.3.13.7	Include ITSG-33 elements in System Acceptance Test	M	A				
4.4	Project Management	Title					
4.4.1	General	Title					
4.4.1.1	Project management disciplines	M	D				
4.4.1.2	Use of an internationally recognized standard for managing project delivery.	M	D				
4.4.1.3	Assignment of an experienced Project Manager	M	D				
4.4.1.4	Project manager authority	M	A				

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4.4.1.5	Point of Contact	M	A				
4.4.2	Subcontract Management	Title					
4.4.2.1	Full disclosure of subcontractors and delegated responsibilities	M	A				
4.4.2.2	Contractor is responsible for all sub-delegation.	M	A				
4.4.2.3	Monitor and report	M	A				
4.4.3	Problem Reporting/Design Changes	Title					
4.4.3.1	Advise CCG	M	A				
4.4.3.2	Advise Contractor	I					
4.4.3.3	Use of an Issues Log	M	A				
4.4.3.4	Use of monthly progress report	M	A				
4.4.3.5	Reporting of Changes	M	A				
4.4.4	Security	Title					
4.4.4.1	Contractor adheres to SRCL.	M	A				
4.4.4.2	Contractor’s staff must be escorted.	M	A				
4.4.5	Project Meetings	Title					
4.4.5.1	Meetings coordinated by Contractor	M	A				
4.4.5.2	Practical coincidence of meetings	I					
4.4.5.3	Meetings conducted by Teleconference at CCG’s discretion	I					



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4.4.6	Conduct of Meetings	Title					
4.4.6.1	Meeting Chairs	M	A				
4.4.6.2	Hosting	M	A				
4.4.6.3	Meeting Responsibilities	M	A				
4.4.6.4	Meeting Agenda and related documents 5 days in advance of Meetings	M	A				
4.4.6.5	Action Items Log	M	A				
4.4.6.6	Outstanding Action Items	M	A				
4.4.6.7	Minutes distributed	M	A				
4.4.6.8	CCG Approval	M	A				
4.4.6.9	Cancellation of Reviews and Meetings	I					
4.4.6.10	Rescheduling of Reviews and Meetings	M	A				
4.4.7	Project Kick-Off Meeting	Title					
4.4.7.1	Meeting within 20 days of contract award	M	A				
4.4.8	Project Progress Review Meetings	Title					
4.4.8.1	Contractor to conduct Monthly PRMs	M	A				
4.4.8.2	Cancelling PRMs	I					
4.4.9	Project Preliminary Design Review Meeting	Title					
4.4.9.1	Contractor to conduct PDR	M	A				
4.4.9.2	Combining meetings	I	A				

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4.4.9.3	Provide the preliminary detailed system concept	M	A				
4.4.9.4	Design approach and technical solution	M	A				
4.4.9.5	Concept documented	M	A				
4.4.9.6	Deliver documentation for software	M	A				
4.4.9.7	Provide meeting materials in advance of PDR	M	A				
4.4.9.8	Design and methodology reviewed	M	A				
4.4.9.9	Complete detailed design	M	A				
4.4.9.10	Provide ITSG-33 non-compliance resolutions	M	A				
4.4.10	Project Critical Design Review Meeting	Title					
4.4.10.1	Contractor to conduct CDR	M	A				
4.4.10.2	Combining PDR with CDR	D	W				
4.4.10.3	Documentation	M	A				
4.4.10.4	Documentation	M	A				
4.4.10.5	Updated responses to RADAR Equipment ITSG-33 Requirements	M	A				
4.4.11	INNAV Interface Readiness Review	Title					
4.4.11.1	IIRR conducted by Contractor	M	A				
4.4.11.2	IIRR collaborative effort	M	A				
4.4.11.3	INNAV Interface Developer	I					
4.4.11.4	Meeting materials 5 days in advance of IIRR	M	A				

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4.4.11.5	Documentation and Data for the Test Lab	M	A				
4.4.12	Spares Provisioning Meeting	Title					
4.4.12.1	SPM conducted by Contractor	M	A				
4.4.12.2	Collaborative effort	M	A				
4.4.12.3	SPM in conjunction with ISSR	M	A				
4.4.12.4	Combining SPM and CDR	I					
4.4.12.5	Meeting materials 5 days in advance of SPM	M	A				
4.4.13	FAT Readiness Review	Title					
4.4.13.1	FRR conducted by Contractor	M	A				
4.4.13.2	Combining FRR with CDR	I					
4.4.13.3	Meeting materials 5 days in advance of FRR	M	A				
4.4.14	Post FAT Review	Title					
4.4.14.1	PFR conducted by Contractor	M	A				
4.4.14.2	Issues and activities	M	A				
4.4.14.3	Demonstrate that the RADAR Equipment is compliant	M	A				
4.4.15	Training Readiness Review	Title					
4.4.15.1	TRR conducted by Contractor	M	A				
4.4.15.2	TRRs a collaborative effort	M	A				
4.4.15.3	Timing mutually agreed	M	A				

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4.4.15.4	Separate TTRs	M	A				
4.4.15.5	Meeting materials 5 days in advance of TRR	M	A				
4.4.16	Installation Readiness Reviews	Title					
4.4.16.1	IRRs conducted by Contractor	M	A				
4.4.16.2	IRRs a collaborative effort	M	A				
4.4.16.3	Timing mutually agreed	M	A				
4.4.16.4	Meeting materials 5 days in advance of IRRs	M	A				
4.4.17	In-Service Support Review Meeting	Title					
4.4.17.1	ISSR conducted by Contractor	M	A				
4.4.17.2	ISSR to review In-Service Support Plan	M	A				
4.4.17.3	ISSR in conjunction with SPM	M	A				
4.4.17.4	Meeting materials 5 days in advance of ISSR	M	A				
4.4.18	Final Project Review Meeting	Title					
4.4.18.1	Final project review meeting conducted by Contractor	M	A				
4.4.18.2	Scope of meeting items	M	A				
4.4.18.3	Confirmation of completion	M	A				
4.4.19	Additional – Extraordinary Meetings	Title					
4.4.19.1	Additional project review meetings conducted by Contractor	M	A				

	<b>Bidder Name</b>						
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4.4.19.2	Suitable Contractor representation at extraordinary meetings	M	A				
4.4.19.3	Scheduling extraordinary meetings	I					
4.5	Testing and Acceptance	Title					
4.5.1	Testing General	Title					
4.5.1.1	FATs, IIT and SATs are CCG’s means of verifying Contractor’s products meet the requirements	I					
4.5.1.2	CCG reserves right to waive or add tests	M	A				
4.5.1.3	CCG to witness all tests at its discretion	M	A				
4.5.2	Test Failures	Title					
4.5.2.1	Resolution of test failures and performance of re-tests	M	A				
4.5.3	Test Diagnostic Routines	Title					
4.5.3.1	Provision of test diagnostic routines prior to IIRR	M	A				
4.5.4	Unit Production Tests	Title					
4.5.4.1	Equipment fully pre-tested prior to integration	M	A				
4.5.4.2	Test results	M	A				
4.5.5	RADAR Equipment V&V Tests	Title					

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4.5.5.1	Verify operation for each different system configuration.	M	A				
4.5.5.2	Test procedures in accordance with Contractors system integration proof of performance test plans.	M	A				
4.5.5.3	System verification report for each different system configuration.	M	A				
4.5.6	Factory Acceptance Tests	Title					
4.5.6.1	Prove that Equipment meets TSORs	M	A				
4.5.6.1.a	Provision of FAT plan and procedures	M	A				
4.5.6.1.b	FAT plan and procedures reviewed at FRR	M	A				
4.5.6.1.c	FAT plan and procedures approved by CCG	M	A				
4.5.6.1.d	FATs witnessed by CCG	M	A				
4.5.6.1.e	Printed copies of Test Procedures	M	A				
4.5.6.1.f	Submit FAT Report	M	A				
4.5.6.1.g	FATs conducted at Contractor’s manufacturing facility with calibrated test equipment with valid calibration dates	M	A				
4.5.6.1.h	Test equipment calibration	M	A				
4.5.6.1.i	CCG entitle to reject the FAT	I					

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4.5.6.1.j	Conduct burn-in as part of FATs	M	A				
4.5.6.1.k	Burn-in test method	M	D				
4.5.6.1.l	Advise CCG of cause of failures and corrective actions	M	A				
4.5.6.1.m	Problems rectified and appropriate re-testing	M	A				
4.5.6.1.n	Provision of FAT Report	M	A				
4.5.6.1.o	FAT Report approved before shipment	M	A				
4.5.6.1.p	Provide CCG-Approved FAT Report in French	M	A				
4.5.7	INNAV Interface Test	Title					
4.5.7.1	IIT consisting of a full System Test with INNAV interface and including compliance with SOW, TSORs and ITSG-33	M	A				
4.5.8	Site Acceptance Tests (SAT)	Title					
4.5.8.1	Perform SATs in accordance with TSORs, ITSG-33 and SOW	M	A				
4.5.8.2	SATs performed immediately following installations	M	A				
4.5.8.3	SATs include operational and RADAR System verification	M	A				
4.5.8.4	Approval	I					

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4.5.8.5	Acceptance	I					
4.5.8.6	CCG will supply test ships for SATs	I					
4.5.9	Configuration Management	Title					
4.5.9.1	Provision of configuration management procedures	M	A				
4.6	Training	Title					
4.6.1	Training Courses	Title					
4.6.1.1	Provisioning of course materials for technical and operational training sessions	M	A				
4.6.1.2	Separate training courses for Operators and Technologists	M	A				
4.6.1.3	‘Train the Trainer’ approach for Operators	M	A				
4.6.1.4	Operational training at the College	M	A				
4.6.1.5	Operational leads and CCGC	I					
4.6.1.6	Operational leads	I					
4.6.1.7	Provision of Operator training course in English and French	M	A				
4.6.1.8	Provision of Operator training materials in English and French	M	A				



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4.6.1.9	Sufficient detail for normal operations and maintenance	M	A				
4.6.1.10	Technical training to the LRU	M	A				
4.6.1.11	CCG Maintenance Technologists	M	A				
4.6.1.12	Technologists training Instructor led	M	A				
4.6.1.13	Technical Training provided at 5 locations	M	A				
4.6.1.14	Technical Training	M	A				
4.6.1.15	Accommodation of course participants	M	A				
4.6.1.16	Training scheduling	M	A				
4.6.1.17	Provisioning of sufficient equipment for training	M	A				
4.6.1.18	Provisioning of sufficient equipment for training	M	A				
4.7	Warranty	Title					
4.7.1	Warranty Repairs	Title					
4.7.1.1	Warranty period	M	A				
4.7.1.2	Warranty service Contractor responsibilities	M	A				
4.7.2	Non-Warranty Repairs	Title					
4.7.2.1	CCG authorization prior to commencing non-warranty repairs	M	A				
4.7.2.2	Task Authorization Form	M	A				
4.7.2.3	Invoiced for the repair	M	A				

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4.8	Post-Warranty Contractor Support	Title					
4.8.1	General	Title					
4.8.1.1	Provision of after warranty support	M	A				
4.8.1.2	Provision of a single point of contact for problem resolution	M	A				
4.8.2	In-Service Support Plan	Title					
4.8.2.1	Anticipated service life is 20 years	I					
4.8.2.2	Provisioning of an in-service support plan	M	A				
4.8.2.3	In-Service Support Plan	M	A				
4.8.2.4	Provisioning of a cost model for optimizing sparing versus and in conjunction with an In-Service Support Plan	M	A				
4.8.2.5	In-Service Support Plan is renewable	M	A				
4.8.2.6	In-Service Support Plan and pricing	M	A				
4.8.3	End of Product Life	Title					
4.8.3.1	Maintain availability of spares and parts	M	A				
4.8.3.2	Notification a year in advance of end production runs	M	A				
4.8.4	Maintenance	Title					
4.8.4.1	CCG’s maintenance philosophy	I					

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4.8.4.2	Provision of equipment repairs	M	A				
4.8.4.3	Provision of procedures for returning equipment	M	A				
4.8.4.4	4 week equipment return times from Contractor’s facility	M	A				
4.8.4.5	Provision of failure and repair reports with returned equipment	M	A				
4.8.4.6	Provision of repair history for all RADAR Equipment upon request	M	A				
4.9	Environmental Requirements	Title					
4.9.1	General	Title					
4.9.1.1	GoC initiative	I					
4.9.1.2	Contractor adheres to environmental stewardship policies and practices	M	A				
4.9.2	Contractor Environmental Commitment	Title					
4.9.2.1	Contractor has a documented EMS	M	W				
4.9.2.2	Environmental policy	M	W				
4.9.2.3	Evidence of implementing policy	M	W				
4.9.2.4	Emergency response and environmental protection plans	M	W				
4.9.3	Power Consumption	Title					

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4.9.3.1	Power consumption for each mode of operation	M	W				
4.9.4	Promote Materials Reduction	Title					
4.9.4.1	Document and quantify use of recycled material in the plastic housing or other components.	M	D				
4.9.4.2	Use of recycled materials in packaging	M	D				
4.9.4.3	Minimize quantity and weight of non-recyclable packaging and shipping materials	M	D				
4.9.5	Recycling	Title					
4.9.5.1	Document material contents to facilitate end-of-life recycling	M	D				
4.9.6	Hazardous Materials	Title					
4.9.6.1	Disclosure of hazardous materials and amounts	M	A				
4.9.6.2	Provision of MSDSs	M	A				
4.9.6.3	Ensure minimum use of hazardous materials	M	A				
4.9.6.4	Disclosure of regulated substances and their amounts	M	A				
4.9.7	On-Site Activities	Title					
4.9.7.1	Compliance with on-site environmental protection practices	M	A				
4.9.7.2	Compliance with on-site environmental protection	M	A				

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	practices						
5.0	Optional items	Title					
5.1	Pricing and period of validity for requested options	M	A				
5.1.1	Optional Technical and Operational Training	Title					
5.1.1.1	Additional Training Option	M	A				
5.1.1.2	Additional Training for Operational Courses and Technical Courses	M	A				
5.1.1.3	Training material and curriculum	M	A				
5.1.2	Optional RADAR Equipment	Title					
5.1.2.1	Provide option for additional RADAR Equipment	M	A				
5.1.2.2	Provide option for additional RADAR Equipment	M	A				
5.1.2.3	Provide option for Antenna Systems with circular polarization	M	W				
5.1.2.4	Provide option for signalling RACONs	M	W				
5.1.2.5	Provide option for a mechanical lock	M	W				
5.1.3	Optional Services Support	Title					
5.1.3.1	Additional Contractor responsibilities for integration/installation support	M	A				
5.1.4	Optional Warranty	Title					

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5.1.4.1	Option for additional warranty period	M	A				
5.1.5	Optional Canadian Point of Contact	Title					
5.1.5.1	Provision of a single point of contact for problem resolution	M	A				
Appendix A	Acronyms	I					
Appendix B	Deliverable list	M	A				
Appendix C	Data & Documentation Formats	M	A				
Appendix D	CDRLs and DIDs	M	A				
Appendix E	National Spares Management Strategy	I					
Appendix F	Supply Plan	M	A				

Table 2 SOW Rated Criteria

Use the table below to assess whether the proposal meets the Rated Requirements identified in this SOW

Note: The Bidder will be asked to match the Contractor's experience with coastal marine X-Band Solid-State RADAR systems and equipment availability to the Rated

Criteria requirement and fill in the Evidence fields “Evidence of Experience” / "Evidence of Equipment Availability" with the requested information as identified.

Rated Criteria	Maximum Points	Evidence of Experience	Point Scale	Bidder Instructions
<b>R1.</b> In reference to 4.1.1.3 and 4.1.1.4  Points are awarded for the Contractor having recent experience within recent years with configuring shore based coastal marine X-Band Solid-State RADAR systems for vessel traffic services.	20  (minimum points required (10 pts))		2003 ≤ no recent experience ≤ January 2019 = 0 pts  2003 ≤ recent experience ≤ 2011 = 10 pts  2012 ≤ recent experience ≤ January 2019 = 20 pts	Bidder must provide name and contact information for each Service Provider or organization where the Contractor has deployed shore based coastal marine X-Band Solid-State RADAR systems for vessel traffic services.  The bidder must provide the dates and durations when the Contractor has deployed shore based coastal marine X-Band Solid-State RADAR systems for each of the Service Providers or organizations performing vessel traffic services.
<b>R2.</b> In reference to 4.1.1.5 and 4.1.1.6  Points are awarded for the Contractor having experience with interfacing shore based coastal marine X-Band Solid-State RADAR systems with VTMISSs.	20  (minimum points required (10 pts))		2003 ≤ No experience interfacing VTMISSs ≤ January 2019 = 0 pts  2003 ≤ Experience interfacing VTMISSs ≤ 2011 = 10 pts  2012 ≤ Experience interfacing VTMISSs ≤ January 2019 = 20 pts	Bidder must identify the deployments for Service Providers or organizations where the Contractor has experience interfacing X-Band Solid-State RADAR systems with a VTMISS to perform vessel traffic services.  The bidder must provide the dates and durations for Service Providers or organizations where the Contractor has experience interfacing X-Band Solid-State RADAR systems with a VTMISS to perform vessel traffic services.
<b>R3.</b> In reference to 4.1.1.2  Points are awarded for the Contractor having experience with interfacing shore based coastal marine X-Band Solid-State RADAR systems with VTMISSs using Asterix.	20		No experience using Asterix = 0 pts  Experience interfacing Asterix = 20 pts	Bidder must identify the deployments for Service Providers or organizations where the Contractor has experience interfacing X-Band Solid-State RADAR systems with a VTMISS using Asterix to perform vessel traffic services.
<b>R4.</b> In reference to 4.1.1.2  Points are awarded for the Contractor having experience with interfacing shore based coastal marine X-Band Solid-State RADAR systems with VTMISSs using IVEF.	20		No experience using IVEF = 0 pts  Experience interfacing IVEF = 20 pts	Bidder must identify the deployments for Service Providers or organizations where the Contractor has experience interfacing X-Band Solid-State RADAR systems with a VTMISS using IVEF to perform vessel traffic services.

<p><b>R5.</b> In reference to 4.1.1.2</p> <p>Points are awarded for the number of shore based coastal marine X-Band Solid-State RADAR systems deployed where the Contractor has previous experience having integrated the same RADAR equipment components as proposed by the Bidder in each of the different remote site RADAR Equipment configurations (REc) for the CCG sites.</p>	20  (minimum points required (5 points))		<p>0 &lt; No. of same REc Deployments &lt; 5 = 5 pts</p> <p>5 ≤ No. of same REc Deployments &lt; 20 = 10 pts</p> <p>20 ≤ No. of same REc Deployments = 20 pts</p>	<p>Bidder must provide a list identifying each of the site deployments where the Contractor has deployed the same RADAR Equipment configurations as proposed for the CCG sites for each of the Service Providers or organizations.</p> <p>Bidder must provide the model numbers of the equipment used in the RADAR Equipment configurations for each of the site deployments where the Contractor has deployed the same RADAR Equipment configurations as proposed for the CCG sites for each of the Service Providers or organizations.</p>
<p><b>R6.</b> In reference to 4.1.1.2</p> <p>Points are awarded for the number of different Service Providers or organizations within the last 15 years where the Contractor has experience interfacing with the RADAR Equipment configurations (REc) the Bidder has proposed for the CCG sites with a VT MIS and is currently in operation providing vessel traffic services.</p>	40		<p>0 &lt; No. of Different Service Providers &lt; 3 = 10 pts</p> <p>3 ≤ No of Different Service Providers &lt; 6 = 20 pts</p> <p>6 ≤ No. of Different Service Providers = 40 pts</p>	<p>Bidder must provide a list identifying each of the Service Providers or organizations where the Contractor has experience interfacing the RADAR Equipment configurations as proposed by the Bidder for CCG with a VT MIS and currently in service performing vessel traffic services.</p>
<b>Rated Criteria</b>	<b>Maximum Points</b>	<b>Evidence of Equipment Availability</b>	<b>Point Scale</b>	
<p><b>R7.</b> In reference to 4.1.2.2</p> <p>Points are awarded for current availability of RADAR Equipment to meet delivery time frames as evidenced by a schedule of RADAR Equipment unit manufacturing production runs in progress with sufficient unit quantities or RADAR Equipment configuration components available off the shelf with deliveries taking place according to the RADAR Equipment Delivery Schedule in section 4.1.2.1 of the SOW.</p>	110		<p>Sufficient RADAR Equipment quantities available to meet scheduled equipment delivery requirements in the first 9 months following CA = 110 pts</p>	<p>Bidder must provide inventory lists of RADAR Equipment configuration components that are currently available off the shelf in inventory.</p> <p>Bidder must provide a production schedule of RADAR Equipment configuration components that are in production and their estimated unit production completion timeframes and subsequent delivery dates.</p>
<b>Minimum Points Required</b>	<b>25</b>			
<b>Maximum Attainable Score</b>	<b>250</b>			



# RADAR TRANSCEIVER AND ANTENNA BID EVALUATION MATRIX

All Bidders must submit a completed RADAR Transceiver and Antenna Bid Evaluation Matrix.

This Matrix provides a list of items (headings and subheadings) contained in the specified documents. Each requirement is listed. All proposals shall be reviewed using this Matrix. Bidders must annotate if Mandatory items are COMPLIANT OR NON-COMPLIANT.

It is the Bidders' responsibility to provide in their proposals clear references to the proof of compliance for mandatory requirements (e.g. section and page number, where the information can be located in their documentation). For INFORMATION items, the Bidders should indicate 'UNDERSTOOD'. Failure to do so does not remove the obligation of the bidder to understand and comply with the requirement when performing the work under any resultant contract. If only a heading or subheading is used, the Bidders' proposals must comply with all requirements detailed under this heading including all sub headings and sub-sub headings etc. Any additional details for a particular section included under the COMMENTS is intended to specify particular details that must be included over and above general information to support bidders' statement of compliance.

The column titled "Compliance Demonstration Method" indicates the minimum required for demonstrating Bid compliance with a mandatory or desirable requirement. Only the Compliance Demonstration Methods (indicated in the Compliance Matrix by the following letter codes) are acceptable for supporting a Bidder's claim of compliancy for each of the requirements:

Letter	Method
"A"	The Bidder must provide a compliance statement to clearly agree that the stated work will be completed, or that the stated requirement will be met.
"D"	The Bidder must provide details as to how the work will be undertaken, or how the stated requirement will be met.
"W"	The Bidder must include the requested information with the Bid.
"S"	The Bidder must provide product specifications, manuals, or other published documentation that demonstrates that the solution(s) proposed fully complies with the requirement.
"M"	The Bidder must provide analysis or simulation predicting the performance of solution(s) proposed, that demonstrates full compliance with the requirement.
"T"	The Bidder must provide test results or documented performance of existing equipment proposed, that demonstrates full compliance with the requirement.
"N/A"	Compliance Demonstration not applicable or not required.

TECHNICAL SPECIFICATION

Section 1

Bidder Name							
RADAR name or identifier							
Section	Description	Compliance M = Mandatory D = Desirable I = Information Title	Compliance Demonstration Method	Bidder Response M = Comply/Do not Comply D = Comply/Partially Comply/Do not Comply I = Acknowledge	Contractor's Reference (Bid Document, Section #, and Page)	Met or Not Met	CCG Comments
1	Document Management	I					
2	Forward	I					
3	Introduction	Title	N/A				
3.1	Requirements	Title	N/A				
3.1.1	Requirements	I					
3.1.2	Requirements	I					
3.1.2.1	Requirements	I					
3.1.2.2	Requirements	I					
3.1.2.3	Requirements	I					
3.1.3	Requirements	I					
3.1.4	Requirements	I					

3.2	Existing RADAR Transceivers and Antenna Systems and Locations	Title	N/A				
3.2.1	Existing RADAR Transceivers and Antenna Systems and Locations	I					
3.2.2	If 5 C&A Antenna Systems are being replaced, inclusion in Site Configurations	M	W				
3.2.3	Existing RADAR Transceivers and Antenna Systems and Locations	I					
3.2.4	Existing RADAR Transceivers and Antenna Systems and Locations	I					
3.3	Summary of Existing Transceivers and Antenna Systems, and Locations	Title	N/A				
3.3.1	Summary of Existing Transceivers and Antenna Systems, and Locations	I					
3.3.1.1	Summary of Existing Transceivers and Antenna Systems, and Locations	I					
3.3.1.2	Summary of Existing Transceivers and Antenna Systems, and Locations	I					

3.3.2	Summary of Existing Transceivers and Antenna Systems Equipment and Locations	M	A				
3.4	RADAR Transceiver and Antenna System to be Delivered	Title	N/A				
3.4.1	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.1.1	RADAR Transceiver and Antenna System to be Delivered	M	S				
3.4.1.2	RADAR Transceiver and Antenna System to be Delivered	M	S				
3.4.1.3	RADAR Transceiver and Antenna System to be Delivered	M	S				
3.4.1.4	RADAR Transceiver and Antenna System to be Delivered	M	S				
3.4.2	RADAR Transceiver and Antenna System to be Delivered	M	S				
3.4.3	RADAR Transceiver and Antenna System to be Delivered	I					

3.4.3.1	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.2	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.3	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.4	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.5	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.6	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.7	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.3.8	RADAR Transceiver and Antenna System to be Delivered	I					
3.4.4	RADAR Transceiver and Antenna System to be Delivered	M	S				

3.5	Quantities of RADAR Transceiver Equipment to be Delivered	Title	N/A				
3.5.1	Quantities of RADAR Transceiver Equipment to be Delivered	M	A				
3.6	Quantities of RADAR Antenna Systems to be Delivered	Title	N/A				
3.6.1	Quantities of RADAR Antenna Systems to be Delivered	M	A				
3.7	Current and New RADAR Site Locations and Elevations	Title	N/A				
3.7.1	Current and New RADAR Site Locations and Elevations	I					
4	Applicable Documentation	Title	N/A				
4.1	Specification and Precedence	Title	N/A				
4.1.1	Specifications and Precedence	M	A				
4.1.1.1	Specifications and Precedence	M	A				
4.1.1.2	Specifications and Precedence	M	A				
4.1.1.3	Specifications and Precedence	M	A				
4.1.1.4	Specifications and Precedence	M	A				
4.1.1.5	Specifications and Precedence	M	A				

4.1.1.6	Specifications and Precedence	M	A				
4.1.1.7	Specifications and Precedence	M	A				
4.1.1.8	Specifications and Precedence	M	A				
4.1.1.9	Specifications and Precedence	M	A				
5	List of Acronyms and	I					
6	RADAR Transceiver and Antenna System Performance Guidelines	Title	N/A				
6.1	RADAR Range Performance	Title	N/A				
6.1.1	RADAR Range Performance	I					
6.1.2	RADAR Range Performance	I					
6.1.3	RADAR Range Performance	I					
6.2	Range and Azimuth, Resolution and Accuracy	Title	N/A				
6.2.1	RADAR Range and Azimuth, Resolution and Accuracy	I					
7	RADAR Transceiver and Antenna System Operational and Surveillance Requirements	Title	N/A				
7.1	Operational Purpose	Title	N/A				
7.1.1	Operational Purpose	I					

7.2	Detection Range Performance	Title	N/A				
7.2.1	Detection Range Performance	I					
7.2.2	Detection Range Performance	I					
7.2.3	Detection Range Performance	I					
7.2.4	Detection Range Performance	I					
7.3	Site-Specific RADAR Range Performance, Target Position (Range & Azimuth) Resolution & Accuracy Requirements	Title	N/A				
7.3.1	Site-Specific RADAR Range Performance, Target Position (Range & Azimuth) Resolution & Accuracy Requirements	M	A				
7.3.2	Site-Specific RADAR Range Performance, Target Position (Range & Azimuth) Resolution & Accuracy Requirements	I					
7.3.3	Site-Specific RADAR Range Performance, Target Position (Range & Azimuth) Resolution & Accuracy Requirements	I					



7.3.4	Site-Specific RADAR Range Performance, Target Position (Range & Azimuth) Resolution & Accuracy Requirements	M	M and D				
7.3.5	Site-Specific RADAR Range Performance , Target Position (Range & Azimuth) Resolution & Accuracy Requirements	I					
Table 7-9	Range and Azimuth, Resolution, and Accuracy	Title	N/A				
Table 7-9.1	Minimum Detection Range	M	S				
Table 7-9.2	Minimum Range Resolution for small point targets	M	M or T or D				
Table 7-9.3	Minimum Range Accuracy for small point targets	M	M or T or D				
Table 7-9.4	Minimum Azimuth Resolution for small point targets	M	M or T or D				
Table 7-9.5	Minimum Azimuth Accuracy for small point targets	M	M or T or D				
Table 7-9.6	Minimum Detection Range	M	S				
Table 7-9.7	Minimum Range Resolution for small point targets	M	M or T or D				
Table 7-9.8	Minimum Range Accuracy for small point targets	M	M or T or D				

Table 7-9.9	Minimum Azimuth Resolution for small point targets	M	M or T or D				
Table 7-9.10	Minimum Azimuth Accuracy for small point targets	M	M or T or D				
Table 7-9.11	Minimum Detection Range	M	S				
Table 7-9.12	Minimum Range Resolution for small point targets	M	M or T or D				
Table 7-9.13	Minimum Range Accuracy for small point targets	M	M or T or D				
Table 7-9.14	Minimum Azimuth Resolution for small point targets	M	M or T or D				
Table 7-9.15	Minimum Azimuth Accuracy for small point targets	M	M or T or D				
7.4	Existing System Details	Title	N/A				
7.4.1	Existing System Details	I					
7.5	Shore-Mounted RADAR	Title	N/A				
7.5.1	Shore-Mounted RADAR	I					
7.5.1.1	Shore-Mounted RADAR	M	A				
7.5.1.2	Shore-Mounted RADAR	M	A				
7.5.1.3	Shore-Mounted RADAR	M	A				

7.5.1.4	Shore-Mounted RADAR	M	A				
7.6	Slant Range Correction	Title					
7.6.1	Slant Range Correction	M	D				
8	RADAR Antenna System Requirements	Title	N/A				
8.1	RADAR Antenna Systems	Title	N/A				
8.1.1	RADAR Antenna Systems	I					
T 8-1.1	Antenna Type	M	S				
T 8-1.2	Frequency Band	M	S				
T 8-1.3	Power handling	M	S				
T 8-1.4	Gain (dBi)	M	S				
T 8-1.5	Polarization	M	S				
T 8-1.6	Polarization (switchable)	D	S				
T 8-1.7	Horizontal beamwidth @ -3 dB	M	S				
T 8-1.8	Vertical Pattern	M	S				
T 8-1.9	Vertical beamwidth @ -3 dB	M	S				

T 8-1.10	VSWR	M	S				
T 8-1.11	Waveguide input	M	S				
T 8-1.12	Motor power requirement	M	S or D				
T 8-1.13	Antenna rotation (@ 60Hz) in RPM	M	S or D				
T 8-1.14	Dual Azimuth Encoders	M	S or D				
T 8-1.15	Dual Azimuth Encoders	M	S or D				
T 8-1.16	Mechanical lock of the antenna	D	S or D				
T 8-1.17	Safety switch interlock	M	S or D				
T 8-1.18	Lightning protection	M	S or D				
T 8-1.19	Temperature of Operation (excluding cold start temperature)	M	S				
T 8-1.20	Heating elements	M	S or D				
T 8-1.21	Wind	M	S or M or T				
T 8-1.22	Wind	M	S or M or T				
T 8-1.23	Ice Loading	M	S or M or T				
T 8-1.24	Ice Loading	M	S or M or T				
T 8-1.25	Salt Fog	M	S or M or T				

8.1.2	Wind or Ice Loading Shutdown	Title	N/A				
8.1.2.1	Wind or Ice Loading Shutdown	M	S or D				
8.1.2.2	Wind or Ice Loading Shutdown	M	S or D				
8.1.2.3	Wind or Ice Loading Shutdown	M	S or D				
8.1.2.4	Wind or Ice Loading Shutdown	M	S or D				
8.2	Built –In Self-Test	Title	N/A				
8.2.1	Monitoring	Title	N/A				
8.2.1.1	Monitoring	M	S				
8.2.1.2	Monitoring	M	S				
8.2.1.3	Monitoring	M	S				
8.2.1.4	Monitoring	M	S				
8.2.2	Antenna System Status and Monitoring	I					
8.2.2.1	Antenna System Status and Monitoring	M	S or D				
8.2.2.2	Antenna System Status and Monitoring	M	S or D				
8.2.2.3	Antenna System Status and Monitoring	M	S or D				

8.2.2.4	Antenna System Status and Monitoring	M	S or D				
8.2.2.5	Antenna System Status and Monitoring	M	S or D				
8.2.2.6	Antenna System Status and Monitoring	M	S or D				
8.2.2.7	Antenna System Status and Monitoring	M	S or D				
8.2.2.8	Antenna System Status and Monitoring	M	S or D				
8.2.2.9	Antenna System Status and Monitoring	M	S or D				
8.2.2.10	Antenna System Status and Monitoring	M	S or D				
8.2.2.11	Antenna System Status and Monitoring	M	S or D				
8.2.3	Simple Network Management Protocol	Title	N/A				
8.2.3.1	Simple Network Management Protocol	M	S or D				
8.2.3.2	Simple Network Management Protocol	M	S or D				
8.3	Reliability and Maintainability	Title	N/A				
8.3.1	Reliability and Maintainability	I					

8.3.2	Mean Time Between Failure and Availability	Title	N/A				
8.3.2.1	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.2	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.3	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.4	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.5	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.6	Mean Time Between Failure and Availability	M	S or M or T				
8.3.2.7	Mean Time Between Failure and Availability	M	S or M or T				
9	RADAR Transceiver Specification	Title	N/A				
9.1	Interface to Existing External Systems	Title	N/A				
9.1.1	Interface to Existing External Systems	M	A				
9.1.2	Interface to Existing External Systems	M	S				
9.2	Configuration	Title	N/A				

9.2.1	Configuration	M	S				
9.2.2	Configuration	M	S or D				
9.2.3	Configuration	M	S or D				
9.2.4	Configuration	M	S or D				
9.3	Frequency Diversity	Title	N/A				
9.3.1	Frequency Diversity	M	S or D				
9.3.2	Frequency Diversity	M	S or D				
9.4	Target to Clutter Improvement	Title	N/A				
9.4.1	Target to Clutter Improvement	M	S or D				
9.5	Features and Configurable Parameters	Title	N/A				
9.5.1	Features and Configurable Parameters	I					
9.5.1.1	Features and Configurable Parameters	I					
9.5.1.2	Features and Configurable Parameters	I					
9.5.2	Features and Configurable Parameters	I					
9.5.2.1	Features and Configurable Parameters	M	A or D or M				



9.5.2.2	Features and Configurable Parameters	I					
9.5.2.3	Features and Configurable Parameters	M	A or D				
9.5.3	Features and Configurable Parameters	M	S or D				
9.5.4	Features and Configurable Parameters	M	A				
9.5.5	Features and Configurable Parameters	M	S				
9.5.6	Auto-Adaptive Sensitivity Control	Title	N/A				
9.5.6.1	Auto-Adaptive Sensitivity Control	M	S or D				
9.5.6.2	Auto-Adaptive Sensitivity Control	M	S or D				
9.5.7	Programmable Power Output Levels	M	S				
9.5.8	Sea Clutter Discriminator	M	S or D				
9.5.9	Logarithmic Video Output	M	S				
9.5.10	Spurious Artefacts	M	S or D				
9.6	RADAR Transceiver Performance Characteristics	Title	N/A				
9.6.1	RADAR Transceiver Performance Characteristics	I					

T 9-1.1	Frequency	M	S				
T 9-1.2	Transmit Power	M	S				
T 9-1.3	Pulse Compression Ratio	M	S				
T 9-1.4	Duty Cycle (percentage)	M	S				
T 9-1.5	RF Power Spectrum	M	S				
T 9-1.6	Sectorized Transmission	M	S				
T 9-1.7	Sectorized transmission	M	S				
T 9-1.8	Profiles	M	S				
T 9-1.9	Receiver Noise Figure (@ 25° C)	M	S				
T 9-1.10	Minimum Discernable Figure	M	S				
T 9-1.11	Overall Dynamic Range	M	S or D				
T 9-1.12	Receiver Bandwidth	M	S or D				
T 9-1.13	Automatic Frequency Control	M	S or D				
T 9-1.14	Sensitivity Time Control	M	S or D				
T 9-1.15	Power Supply	M	S or D				
T 9-1.16	Mechanical	M	S				
T 9-1.17	RF Connector	M	S or D				
9.7	Transceiver Video Interface Requirements	Title	N/A				

9.7.1	Transceiver Video Interface Requirements	M	S or D				
9.8	RADAR Maintenance and Information Display	Title	N/A				
9.8.1	RADAR Maintenance and Information Display	M	S or D				
9.8.2	RADAR Maintenance and Information Display	M	S or D				
9.8.3	RADAR Maintenance and Information Display	M	S or D				
9.8.4	RADAR Maintenance and Information Display	M	S or D				
9.8.5	RADAR Maintenance and Information Display	M	S or D				
9.8.6	Network connection	Title					
9.8.6.1	Network connection	M	S or A				
9.8.6.2	Network connection	M	S or A				
9.8.7	RADAR Maintenance and Information Display	M	S or D				
9.8.8	RADAR Maintenance and Information Display	M	S or D				
9.8.9	RADAR Maintenance and Information Display	M	S or D				
9.9	Transceiver Control Interface	Title	N/A				

9.9.1	Transceiver Control Interface	M	S or D				
9.9.2	Transceiver Control Interface	M	S or D				
9.9.3	Transceiver Control Interface	I					
9.9.4	RADAR Controls	Title	N/A				
9.9.4.1	RADAR Controls	M	S or D				
9.9.4.2	RADAR Controls	M	S or D				
9.9.4.3	RADAR Controls	M	S or D				
9.9.4.4	RADAR Controls	M	S or D				
9.9.4.5	RADAR Controls	M	S or D				
9.9.4.6	RADAR Controls	M	S or D				
9.9.4.7	RADAR Controls	M	S or D				
9.9.4.8	RADAR Controls	M	S or D				
9.9.4.9	RADAR Controls	M	S or D				
9.9.5	RADAR Feedback	Title	N/A				
9.9.5.1	RADAR Feedback	M	S or D				
9.9.5.2	RADAR Feedback	M	S or D				
9.9.5.3	RADAR Feedback	M	S or D				
9.9.5.4	RADAR Feedback	M	S or D				
9.9.5.5	RADAR Feedback	M	S or D				

9.9.5.6	RADAR Feedback	M	S or D				
9.9.6	RADAR Redundancy Controls	Title	N/A				
9.9.6.1	RADAR Redundancy Controls	M	S or D				
9.9.6.2	RADAR Redundancy Controls	M	S or D				
9.9.6.3	RADAR Redundancy Controls	M	S or D				
9.9.6.4	RADAR Redundancy Controls	M	S or D				
9.10	Trigger signal to inhibit a local RACON	Title	N/A				
9.10.1	Trigger signal to inhibit a local RACON	M	S or D				
9.10.2	Trigger signal to inhibit a local RACON	I					
9.10.3	Trigger signal to inhibit a local RACON	I					
9.10.3.1	Trigger signal to inhibit a local RACON	M	S or D				
9.10.3.2	Trigger signal to inhibit a local RACON	M	S or D				
9.10.3.3	Trigger signal to inhibit a local RACON	M	S or D				

9.10.3.4	Trigger signal to inhibit a local RACON	M	S or D				
9.11	Built-In Self-Test (BIST)	Title	N/A				
9.11.1	BIST	M	S				
9.11.2	BIST	M	S				
9.11.3	BIST	I					
9.11.4	BIST	M	S				
9.12	RADAR Transceiver BIST	Title	N/A				
9.12.1	RADAR Transceiver BIST	I					
9.12.1.1	RADAR Transceiver BIST	M	S or D				
9.12.1.2	RADAR Transceiver BIST	M	S or D				
9.12.1.3	RADAR Transceiver BIST	M	S or D				
9.12.1.4	RADAR Transceiver BIST	M	S or D				
9.12.1.5	RADAR Transceiver BIST	M	S or D				
9.12.1.6	RADAR Transceiver BIST	M	S or D				
9.12.1.7	RADAR Transceiver BIST	M	S or D				
9.12.1.8	RADAR Transceiver BIST	M	S or D				
9.12.1.9	RADAR Transceiver BIST	M	S or D				
9.12.1.10	RADAR Transceiver BIST	M	S or D				

9.12.1.11	RADAR Transceiver BIST	M	S or D				
9.12.1.12	RADAR Transceiver BIST	M	S or D				
9.12.1.13	RADAR Transceiver BIST	M	S or D				
9.12.1.14	RADAR Transceiver BIST	M	S or D				
9.12.1.15	RADAR Transceiver BIST	M	S or D				
9.13	Simple Network Management Protocol	Title	N/A				
9.13.1	Simple Network Management Protocol	M	S or D				
9.13.2	Simple Network Management Protocol	M	S or D				
9.14	Reliability and Maintainability	Title	N/A				
9.14.1	Reliability and Maintainability	I					
9.14.2	Mean Time Between Failure and Availability	Title	N/A				
9.14.2.1	Mean Time Between Failure and Availability	M	S or M or T				
9.14.2.2	Mean Time Between Failure and Availability	M	S or M or T				
9.14.2.3	Mean Time Between Failure and Availability	M	S or M or T				
9.14.2.4	Mean Time Between Failure and Availability	M	S or M or T				

9.14.2.5	Mean Time Between Failure and Availability	M	S or M or T				
9.14.2.6	Mean Time Between Failure and Availability	M	S or D				
9.14.3	Maintainability	Title	N/A				
9.14.3.1	Maintainability	M	S or D				
9.14.3.2	Maintainability	M	S				
9.14.3.3	Maintainability	M	S				
9.14.3.4	Maintainability	M	S				
10	Safety, Environmental and Approval of Equipment	Title	N/A				
10.1	Radiated Emissions	Title	N/A				
10.1.1	Radiated Emissions	M	S or M or T				
10.1.2	Radiated Emissions	M	S or M or T				
10.2	Electrical Safety	Title	N/A				
10.2.1	Safety Certification	M	S or D				
10.2.2	Electrical Safety Authority	I					
10.2.3	Personnel Safety Requirements	M	A				
10.2.3.1	Personnel Safety Requirements	M	S or D				



10.2.3.2	Personnel Safety Requirements	M	S or D				
10.2.3.3	Personnel Safety Requirements	M	S or D				
10.2.3.4	Personnel Safety Requirements	M	S or D				
10.2.3.5	Personnel Safety Requirements	M	S or D				
10.2.3.6	Personnel Safety Requirements	M	S or D				
10.2.3.7	Personnel Safety Requirements	M	S or D				
10.2.3.8	Personnel Safety Requirements	M	S or D				
10.3	Environmental Conditions	Title	N/A				
10.3.1	Operational Conditions	I					
10.3.1.1	Operational Conditions	M	S or T				
10.3.1.2	Operational Conditions	M	S or T				
10.3.2	Storage and Transportation	I					
10.3.2.1	Storage and Transportation	M	S or T				
10.3.2.2	Storage and Transportation	M	S or T				
10.4	AC Power Transients and Interruptions	Title	N/A				

10.4.1	AC Power Transients	M	S or D or T				
10.4.2	Voltage Spikes	M	S or D or T				
10.4.3	AC Power Restoration	M	S or D				

Table 2 below will be used to assess the Rated Requirements associated with the Transceiver and Antenna TSOR.

DRAFT

Section 2

Table 1: Rated Criteria

Rated Criteria	Maximum Points	Compliance	Compliance Demonstration Method	Point Scale	Bidder Instructions	Contractor's Reference
<b>R1.</b> In reference to T 8-1.5 and T 8-1.6.  T 8-1.6: It is desirable that the X-Band Antenna System be switchable between Horizontal and Circular polarization.	100	M	S	Horizontally polarized X-Band Antenna System = 0 pts (Non-switchable)	Bidder must submit with the bid an option with pricing to purchase RADAR Antenna Systems with the capability to switch between horizontal and circular polarization if this capability is available for the various antenna sizes. (SOW 5.1.2)	
		D		Switchable between Circularly and Horizontally = 100 pts polarized antenna		
<b>R2.</b> In reference to T 8-1.10.  It is desirable that the X-Band Antenna System have VSWR less than or equal to 1.2:1.	60	M	S	$1.2:1 < \text{VSWR} \leq 1.4:1 = 0 \text{ pts}$	Bidder must provide technical documentation that identifies what the VSWR is for the individual Antenna Systems within the different Radar Equipment configurations proposed in the bid for the remote sites.	
		D		$\text{VSWR} \leq 1.2:1 = 60 \text{ pts}$		
<b>R3.</b> In reference to T 8-1.16.  It is desirable that the X-Band Antenna System have a mechanical lock to prevent the Antenna from turning during exterior maintenance activities.	40		S or D	No mechanical lock = 0 pts	Bidder must submit with the bid an option with pricing to provide a mechanical lock to prevent the antenna sail from rotating during exterior maintenance activities, if this capability is available for all the antennas. (SOW 5.1.2)	
		D		Mechanical lock provided = 40 pts		

Rated Criteria	Maximum Points	Compliance	Compliance Demonstration Method	Point Scale	Bidder Instructions	Contractor's Reference
<b>R4.</b> In reference to 10.3.1.2  It is desirable that the RADAR transceiver as demonstrated through testing as being able to operate in environmental conditions with a relative humidity of 95% non-condensing at 45°C.	20	M	S or T	Operating up to 90% RH at 40°C = 0 pts	Bidder must provide test rating certifications and standards used to demonstrate this operational capability.	
		D		Operating up to 95% RH at 45°C = 20 pts		
<b>R5.</b> In reference to 10.3.2.2  It is desirable that the RADAR transceiver as demonstrated through testing as being able to be stored in environmental conditions with a relative humidity of 95% non-condensing at 45°C .	20	M	S or T	Operating up to 90% RH at 40°C = 0 pts	Bidder must provide test rating certifications and standards used to demonstrate this operational capability	
		D		Operating up to 95% RH at 45°C = 20 pts		
<b>Maximum Attainable Score</b>	<b>240</b>					

Table 2 below is for Bidder input.

**Table 2: RFP Rating response for RADAR Transceiver and Antenna TSOR:**

For each equipment configuration proposed for each site the Bidder must complete the following table by identifying the equipment model types.

For each rated criteria, points will be awarded for each site as described in the rated criteria above. The points for each site will be totalled within each rated criteria and divided by the number of sites to produce an average score.

					RADAR Transceiver and Antenna TSOR ratings				
			EQUIPMENT MODEL		R1	R2	R3	R4	R5
REGION	MCTS Centre	Remote Site	Transceiver	Antenna System	Polarization	VSWR	Lock	Humidity @ 45°C	Humidity @ 45°C
					(switchable: y/n)	(≤ 1.2: y/n)	(available: y/n)	(up to 95%: y/n)	(up to 95%: y/n)
ATLANTIC North Sector	Placentia	Arnolds Cove							
	Placentia	Cuslett							
	Placentia	Pearce Peak							
	Port Aux Basques	Port Aux Basques							
	Goose Bay Labrador	Site A (new)							
	Placentia	Site B (new)							
	Placentia	Site D (new)							
ATLANTIC South Sector	Halifax	Chebucto Head							
	Halifax	Georges Island							
	Halifax	Shannon Hill							
	Halifax	Partridge Island							
	Halifax	Red Head							
	Halifax	Tiverton							
	Sydney	Eddy Point							
	Sydney	Site J (new)							
	Sydney	Site K (new)							

C&A St. Laurent Sector	Les Escoumins	Les Escoumins		Terma 21' HG-HP-I-37	---	---	---		
	Québec	Île Charron		CHL SGX38.0H21-IC2	---	---	---		
	Québec	Pont Jacques Cartier		Terma 7' CO-HP-F-21	---	---	---		
	Québec	Lévis		CHL SGX38.0H21-IC2	---	---	---		
C&A Great Lakes Sector	Sarnia	Point Edward		CHL SGX38.0H21-IC2	---	---	---		
WESTERN	Prince Rupert	Mt. Ozzard							
	Victoria	Berry Point							
	Victoria	Kap 100							
	Victoria	Bowen Island							
	Victoria	Mt. Helmcken							
	Victoria	Mt. Newton							
	Victoria	Mt. Parke							
	Victoria	Site C (new)							
	Prince Rupert	Site E (new)							
	Prince Rupert	Site F (new)							
	Prince Rupert	Site G (new)							
	Victoria	Site H (new)							
	Victoria	Site I (new)							

Table 3 below illustrates how the ratings are applied.

**Table 3: RFP Rating response for RADAR Transceiver and Antenna TSOR (100%):**

REGION	MCTS Centre	Remote Site	EQUIPMENT MODEL		RADAR Transceiver and Antenna TSOR ratings				
			Transceiver	Antenna System	R1	R2	R3	R4	R5
					Polarization (switchable: y/n)	VSWR (≤ 1.2: y/n)	Lock (available: y/n)	Humidity @ 45°C (up to 95%: y/n)	Humidity @ 45°C (up to 95%: y/n)
ATLANTIC North Sector	Placentia	Arnolds Cove			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Cuslett			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Pearce Peak			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Port Aux Basques	Port Aux Basques			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Goose Bay Labrador	Site A (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Site B (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Site D (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
ATLANTIC South Sector	Halifax	Chebucto Head			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Georges Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Shannon Hill			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Partridge Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Red Head			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Tiverton			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Eddy Point			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Site J (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Site K (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
C&A St. Laurent Sector	Les Escoumins	Les Escoumins		Terma 21' HG-HP-I-37	---	---	---	y=20, n=0	y=20, n=0
	Québec	Île Charron		CHL SGX38.0H21-IC2	---	---	---	y=20, n=0	y=20, n=0

C&A Great Lakes Sector	Québec	Pont Jacques Cartier		Terma 7' CO-HP-F-21	---	---	---	y=20, n=0	y=20, n=0
	Québec	Lévis		CHL SGX38.0H21-IC2	---	---	---	y=20, n=0	y=20, n=0
	Sarnia	Point Edward		CHL SGX38.0H21-IC2	---	---	---	y=20, n=0	y=20, n=0
WESTERN	Prince Rupert	Mt. Ozzard			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Berry Point			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Kap 100			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Bowen Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Helmcken			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Newton			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Parke			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site C (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site E (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site F (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site G (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site H (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site I (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
Average of all sites (for max points):					<u>2900/29 = 100</u>	<u>1740/29 = 60</u>	<u>1160/29 = 40</u>	<u>680/34 = 20</u>	<u>680/34 = 20</u>
SUM		240							

Table 4 below illustrates how the ratings are applied for the case where the Bidder chooses to replace the Antenna Systems in the C&A region.

Table 4: RFP Rating response for RADAR Transceiver and Antenna TSOR (100%):

					RADAR Transceiver and Antenna TSOR ratings
--	--	--	--	--	--



			EQUIPMENT MODEL		R1	R2	R3	R4	R5
REGION	MCTS Centre	Remote Site	Transceiver	Antenna System	Polarization	VSWR	Lock	Humidity @ 45°C	Humidity @ 45°C
					(switchable: y/n)	(≤ 1.2: y/n)	(available: y/n)	(up to 95%: y/n)	(up to 95%: y/n)
ATLANTIC North Sector	Placentia	Arnolds Cove			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Cuslett			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Pearce Peak			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Port Aux Basques	Port Aux Basques			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Goose Bay Labrador	Site A (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Site B (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Placentia	Site D (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
ATLANTIC South Sector	Halifax	Chebucto Head			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Georges Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Shannon Hill			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Partridge Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Red Head			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Halifax	Tiverton			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Eddy Point			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Site J (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Sydney	Site K (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
C&A St. Laurent Sector	Les Escoumins	Les Escoumins			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Québec	Île Charron			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Québec	Pont Jacques Cartier			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Québec	Lévis			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
C&A Great Lakes Sector	Sarnia	Point Edward			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
WESTERN	Prince Rupert	Mt. Ozzard			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Berry Point			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0

	Victoria	Kap 100			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Bowen Island			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Helmcken			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Newton			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Mt. Parke			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site C (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site E (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site F (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Prince Rupert	Site G (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site H (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Victoria	Site I (new)			y=100, n=0	y=60, n=0	y=40, n=0	y=20, n=0	y=20, n=0
	Average of all sites (for max points):								
SUM					<u>3400/34 = 100</u>	<u>2040/34 = 60</u>	<u>1360/34 = 40</u>	<u>680/34 = 20</u>	<u>680/34 = 20</u>

## **EXTRACTOR/TRACKER TSOR BID EVALUATION MATRIX**

All Bidders must submit a completed Extractor/Tracker TSOR Bid Evaluation Matrix.

This Matrix provides a list of items (headings and subheadings) contained in the specified documents. Each requirement is listed. All proposals shall be reviewed using this Matrix. Bidders must annotate if Mandatory items are COMPLIANT OR NON-COMPLIANT.

It is the Bidders' responsibility to provide in their proposals clear references to the proof of compliance for mandatory requirements (e.g. section and page number, where the information can be located in their documentation). For INFORMATION items, the Bidders should indicate 'UNDERSTOOD'. Failure to do so does not remove the obligation of the bidder to understand and comply with the requirement when performing the work under any resultant contract. If only a heading or subheading is used, the Bidders' proposals must comply with all requirements detailed under this heading including all sub headings and sub-sub headings etc. Any additional details for a particular section included under the COMMENTS is intended to specify particular details that must be included over and above general information to support bidders' statement of compliance.

The column titled "Compliance Demonstration Method" indicates the minimum required for demonstrating Bid compliance with a mandatory or desirable requirement. Only the Compliance Demonstration Methods (indicated in the Compliance Matrix by the following letter codes) are acceptable for supporting a Bidder's claim of compliancy for each of the requirements:

Letter	Method
"A"	The Bidder must provide a compliance statement to clearly agree that the stated work will be completed, or that the stated requirement will be met.
"D"	The Bidder must provide details as to how the work will be undertaken, or how the stated requirement will be met.
"W"	The Bidder must include the requested information with the Bid.
"S"	The Bidder must provide product specifications, manuals, or other published documentation that demonstrates that the solution(s) proposed fully complies with the requirement.
"M"	The Bidder must provide analysis or simulation predicting the performance of solution(s) proposed, that demonstrates full compliance with the requirement.
"T"	The Bidder must provide test results or documented performance of existing equipment proposed, that demonstrates full compliance with the requirement.
"N/A"	Compliance Demonstration not applicable or not required.

## A.1 TECHNICAL SPECIFICATION

### Section 1

Bidder						
RADAR name or identifier						
Section	Description	Compliance	Compliance Demonstration Method	Compliance Statement	Contractor's Reference	Comments
		M = Mandatory D = Desirable I = Information		C = Compliant N = Non-compliant N/A = Not applicable	Documentation Section, Page Number etc.	
1	Document Management	I				
2	Forward	Title		N/A		
2.1	Purpose	Title		N/A		
2.1.1	Purpose	I				
2.2	Scope	Title		N/A		
2.2.1	Scope	I				
3	Introduction	Title		N/A		
3.1	Requirements	Title		N/A		
3.1.1	Requirements	I				
3.1.2	Requirements	I				
3.1.3	Requirements	I				
3.1.4	Requirements	I				
4	Applicable Documentation	Title		N/A		
4.1	Specification and Precedence	Title		N/A		
4.1.1	Specification and Precedence	M	A			

5	List of Acronyms and Initialisms	I				
6	Extractor Performance and Functionality	Title		N/A		
6.1	Plots, Fragments, and Targets	Title		N/A		
6.1.1	Plots, Fragments, and Targets	I				
6.2	General Features	Title		N/A		
6.2.1	General Features	I				
6.3	Display and Configuration	Title		N/A		
6.3.1	Display and Configuration	M	D			
6.3.2	Display and Configuration	M	D			
6.4	Geographical Processing	Title		N/A		
6.4.1	Geographical Processing	I				
6.4.2	Geographical Processing	M	S			
6.4.3	Geographical Processing	M	S			
6.4.4	Geographical Processing	M	S			
6.4.5	Geographical Processing	M	S			
6.5	Built-In Self-Test	Title		N/A		
6.5.1	Built-In Self-Test (BIST)	M	S			
6.5.2	BIST	M	S			
6.5.3	BIST	M	S			
6.5.4	BIST	M	S			
6.6	Reliability and Maintainability	Title		N/A		
6.6.1	Mean Time Between Failure (MTFB)	Title		N/A		
6.6.1.1	MTBF	M	T or M			
6.6.1.2	MTBF	M	T or M			
6.6.1.3	MTBF	M	T or M			

6.6.2	Mean Time to Repair (MTTR)	M	D			
6.6.3	Rack Mountable	M	S			
6.6.4	Redundancy	M	D			
6.7	Video Processing	Title		N/A		
6.7.1	Video Processing	M	S			
6.7.2	Video Processing	M	D			
6.7.3	Target Representation	M	D			
6.8	Plot Extraction	Title		N/A		
6.8.1	Plot Extraction	M	A			
6.8.2	Plot Extraction	I				
6.9	Track Initiation	Title		N/A		
6.9.1	Track Initiation	M	A			
6.9.2	Track Initiation	M	A			
6.9.3	Track Initiation	M	D			
6.9.4	Track Initiation	I				
6.9.5	Track Initiation	M	D			
6.9.6	Track Initiation	M	S			
6.10	Maintaining Tracks	Title		N/A		
6.10.1	Maintaining Tracks	M	A			
6.10.2	Maintaining Tracks	M	S			
6.10.3	Maintaining Tracks	I				
6.11	Track Termination	Title		N/A		
6.11.1	Track Termination	M	S			
6.11.2	Track Termination	M	S			
6.11.3	Track Termination	M	D			
6.11.4	Track Termination	M	S			

6.12	Tracking Performance Requirements	Title		N/A		
6.12.1	Tracking Performance Requirements	I				
6.12.2	Tracking Performance Requirements	I				
Table 6-1	System Tracking Performance Requirements	Title		N/A		
Table 6-1.1	System Tracking Performance Requirements	M	A			
Table 6-1.2	System Tracking Performance Requirements	M	A			
Table 6-1.3	System Tracking Performance Requirements	M	S			
Table 6-1.4	System Tracking Performance Requirements	M	S			
Table 6-1.5	System Tracking Performance Requirements	M	S			
Table 6-1.6	System Tracking Performance Requirements	M	A			
Table 6-1.7	System Tracking Performance Requirements	M	A			
Table 6-1.8	System Tracking Performance Requirements	M	A			
Table 6-1.9	System Tracking Performance Requirements	M	S			
Table 6-1.10	System Tracking Performance Requirements	M	S			
Table 6-1.11	System Tracking Performance Requirements	M	S			
Table 6-1.12	System Tracking Performance Requirements	M	S			

6.12.3	Track Initiation and Track Maintenance	Title		N/A		
6.12.3.1	Track Initiation and Track Maintenance	M	D			
6.12.3.2	Track Initiation and Track Maintenance	M	D			
6.12.3.3	Track Initiation and Track Maintenance	I				
6.12.3.4	Track Initiation and Track Maintenance	M	S			
6.12.4	False Tracks	Title		N/A		
6.12.4.1	False Tracks	I				
6.12.4.2	False Tracks	I				
6.12.4.3	False Tracks	M	S			
7	Extractor Interfaces	Title		N/A		
7.1	Video Interfaces	Title		N/A		
7.1.1	Video Interfaces	M	A			
7.2	Transceiver Video Interface	Title		N/A		
7.2.1	Transceiver Video Interface	M	D			
7.2.2	Transceiver Video Interface	D	D			
7.3	RADAR Video Interface	Title		N/A		
7.3.1	RADAR Video Interface	M	D			
7.3.2	Digital Video Feed	Title		N/A		
7.3.2.1	Digital Video Feed	M	A			
7.3.2.2	Digital Video Feed	M	D			
7.3.2.3	Digital Video Feed	M	A			
7.3.2.4	Digital Video Feed	M	A			
7.3.2.5	Digital Video Feed	M	S			



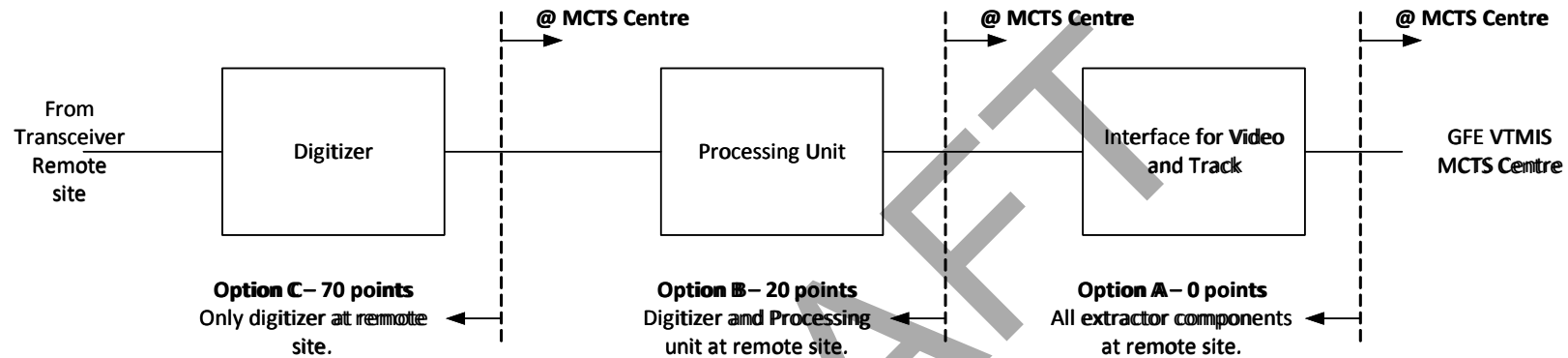
7.4	RADAR Track Interface	Title		N/A		
7.4.1	RADAR Track Interface	M	S			
7.4.2	RADAR Track Interface	M	S			
7.4.3	RADAR Track Interface	I				
7.4.4	Track Information	Title				
7.4.4.1	Track information	M	S			
7.4.4.2	Track information	M	A			
7.4.5	Tracker Controls	Title		N/A		
7.4.5.1	Tracker Controls	M	S			
7.4.5.2	Tracker Controls	M	S			
7.4.5.3	Tracker Controls	M	S			
7.4.5.4	Tracker Controls	M	S			
7.4.5.5	Tracker Controls	M	S			
7.4.5.6	Tracker Controls	M	S			
7.4.5.7	Tracker Controls	M	S			
7.4.5.8	Tracker Controls	M	S			
7.4.6	Tracker Feedback	Title		N/A		
7.4.6.1	Tracker Feedback	M	S			
7.4.6.2	Tracker Feedback	M	S			
7.4.6.3	Tracker Feedback	M	S			
7.4.6.4	Tracker Feedback	M	S			
7.4.6.5	Tracker Feedback	M	S			
7.4.6.6	Tracker Feedback	M	S			
7.4.6.7	Tracker Feedback	M	S			
7.5	RADAR Video Recording Interface	Title		N/A		

7.5.1	RADAR Video Recording Interface	M	D			
7.6	RADAR Site Bandwidth Limitation	Title		N/A		
7.6.1	RADAR Site Bandwidth Limitation	I				
7.6.2	RADAR Site Bandwidth Limitation	M	D			
8	Safety, Environmental and Approval of Equipment	Title		N/A		
8.1	Electrical Safety	Title		N/A		
8.1.1	Safety Certification	Title		N/A		
8.1.1.1	Safety Certification	M	A			
8.1.2	Electrical Safety Authority	Title		N/A		
8.1.2.1	Electrical Safety Authority	I				
8.1.3	Personal Safety Requirements	Title		N/A		
8.1.3.1	Personal Safety Requirements	M	A			
8.1.3.2	Personal Safety Requirements	M	A			
8.1.3.3	Personal Safety Requirements	M	D			
8.1.3.4	Personal Safety Requirements	M	D			
8.1.3.5	Personal Safety Requirements	M	A			
8.2	Environmental Conditions	Title		N/A		
8.2.1	Operational Temperature and Humidity	Title		N/A		
8.2.1	Operational Temperature and Humidity	I				
8.2.1.1	Operational Temperature and Humidity	M	S or T			
8.2.1.2	Operational Temperature and Humidity	M	S or T			

8.3	AC Power Transients and Interruptions	Title		N/A		
8.3.1	Voltage Transients	Title		N/A		
8.3.1.1	Voltage Transients	M	D			
8.3.2	Voltage Spikes	Title		N/A		
8.3.2.1	Voltage Spikes	M	D			
8.3.3	AC Power Restoration	Title		N/A		
8.3.3.1	AC Power Restoration	M	A			

DRAFT

Figure 1: Rated Requirements for R1



NOTE 1: For all options above, 10 pts will be added if all equipment at remote site is integrated in the transceiver unit

NOTE 2: For option C above, 20 pts will be added if the digitizer offers compression of the data sent to the processing unit

Table 1 below will be used to assess the Rated Requirements associated with the Extractor TSOR.

## Section 2

Table 1: Rated Criteria

Rated Criteria	Maximum Points	Compliance	Compliance Demonstration Method	Point Scale		Bidder Instructions	Contractor's Reference
<b>R1</b> In reference to 7.2.2 The Extractors may be located separately from the RADAR Transceiver in order to allow CCG to reduce the complexity of the equipment located at remote sites.  Preference is given to RADAR Equipment configurations where the Extractor digitizer, with compression is integrated within the RADAR Transceiver at the remote site, and the Extractor processing unit and interface module are at the MCTS.  Refer to Figure 1.	100	D	D	a)	- All Extractor components at remote site, external to Transceiver = 0 pts	For each site the Bidder must provide a RADAR Equipment configuration, with the bid, identifying which extractor components are located at the remote site and which are located at the MCTS centre, and complete Table 2 below.	
				b)	- All Extractor components at remote site, integrated within the Transceiver = 10 pts		
				c)	- Extractor digitizer and processing unit at remote site, - Interface module at MCTS centre = 20 pts		
				d)	- Extractor digitizer and processing unit at remote site integrated within the Transceiver, - Interface module at MCTS centre = 30 pts		
				e)	- Extractor digitizer without compression at remote site, - Processing unit and interface module at MCTS centre = 70 pts		
				f)	- Extractor digitizer without compression at remote site integrated within the Transceiver, - Processing unit and interface module at MCTS centre = 80 pts		
				g)	- Extractor digitizer with compression at remote site, - Processing unit and interface module at MCTS centre = 90 pts		

				h)	<ul style="list-style-type: none"> <li>- Extractor digitizer with compression at remote site integrated within the Transceiver,</li> <li>- Processing unit and interface module at MCTS centre = 100 pts</li> </ul>		
<b>R2.</b> In reference to 7.3.2.5 The Video Amplitude for the Digital Video Feed of the RADAR Video Interface must be $\geq 8$ bits.	100	D	D	a)	Video Amplitude < 10 bits = 0 pts	The Bidder must provide with the bid technical documentation that describes the RADAR Video Amplitude Resolution for Extractor RADAR Video Interface and describes the details as to how the video amplitude	
				b)	$10 \text{ bits} \leq \text{Video Amplitude} < 12 \text{ bits} = 30 \text{ pts}$		
				c)	$12 \text{ bits} \leq \text{Video Amplitude} < 14 \text{ bits} = 60 \text{ pts}$		

				d)	$14 \leq \text{Video Amplitude} = 100 \text{ pts}$	resolution is preserved through the transceiver/extract or signal processing chain and through the conversion to the ASTERIX for the configuration used in R1.	
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The Table 2 below is for Bidder input.

**Table 2: RFP Rating response for RADAR Extractor TSOR**

For each equipment configuration proposed for each site the Bidder must complete the following table by identifying the equipment model type and location, as well as the maximum video amplitude resolution that can be preserved end to end.

For each rated criteria, points will be awarded for each site as described in the rated criteria above. The points for each site will be totalled within each rated criteria and divided by the number of sites to produce an average score.

						Maximum preserved video amplitude resolution  Bits	RADAR Extractor TSOR ratings	
			EQUIPMENT MODEL				R1	R2
REGION	MCTS Centre	Remote Site	Extractor				Location	Resolution
			Digitizer	Processor	Interface		(config: a/b/c/d/e/f/g/h)	(config: a/b/c/d)
ATLANTIC North Sector	Placentia	Arnolds Cove						
	Placentia	Cuslett						
	Placentia	Pearce Peak						
	Port Aux Basques	Port Aux Basques						
	Goose Bay Labrador	Site A (new)						
	Placentia	Site B (new)						
	Placentia	Site D (new)						
ATLANTIC South Sector	Halifax	Chebucto Head						
	Halifax	Georges Island						
	Halifax	Shannon Hill						
	Halifax	Partridge Island						
	Halifax	Red Head						
	Halifax	Tiverton						
	Sydney	Eddy Point						
	Sydney	Site J (new)						
	Sydney	Site K (new)						



<b>C&amp;A St. Laurent Sector</b>	Les Escoumins	Les Escoumins						
	Québec	Île Charron						
	Québec	Pont Jacques Cartier						
	Québec	Lévis						
<b>C&amp;A Great Lakes Sector</b>	Sarnia	Point Edward						
<b>WESTERN</b>	Prince Rupert	Mt. Ozzard						
	Victoria	Berry Point						
	Victoria	Kap 100						
	Victoria	Bowen Island						
	Victoria	Mt. Helmcken						
	Victoria	Mt. Newton						
	Victoria	Mt. Parke						
	Victoria	Site C (new)						
	Prince Rupert	Site E (new)						
	Prince Rupert	Site F (new)						
	Prince Rupert	Site G (new)						
	Victoria	Site H (new)						
	Victoria	Site I (new)						

Table 3 below illustrates how the ratings are applied.

**Table 3: RFP Rating response for RADAR Extractor TSOR (100%).**

						Maximum preserved video amplitude resolution  Bits	RADAR Extractor TSOR ratings	
			EQUIPMENT MODEL				R1	R2
REGION	MCTS Centre	Remote Site	Extractor				Location (config: a/b/c/d/e/f/g/h)	Resolution (config: a/b/c/d)
			Digitizer	Processor	Interface			
ATLANTIC North Sector	Placentia	Arnolds Cove					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Placentia	Cuslett					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Placentia	Pearce Peak					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Port Aux Basques	Port Aux Basques					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Goose Bay Labrador	Site A (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Placentia	Site B (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Placentia	Site D (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
ATLANTIC South Sector	Halifax	Chebucto Head					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Halifax	Georges Island					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Halifax	Shannon Hill					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Halifax	Partridge Island					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Halifax	Red Head					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Halifax	Tiverton					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Sydney	Eddy Point					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Sydney	Site J (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Sydney	Site K (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100

<b>C&amp;A St. Laurent Sector</b>	Les Escoumins	Les Escoumins					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Québec	Île Charron					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Québec	Pont Jacques Cartier					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Québec	Lévis					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
<b>C&amp;A Great Lakes Sector</b>	Sarnia	Point Edward					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
<b>WESTERN</b>	Prince Rupert	Mt. Ozzard					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Berry Point					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Kap 100					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Bowen Island					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Mt. Helmcken					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Mt. Newton					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Mt. Parke					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Site C (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Prince Rupert	Site E (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Prince Rupert	Site F (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Prince Rupert	Site G (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Site H (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
	Victoria	Site I (new)					a=0, b=10, c=20, d=30, e=70, f=80, g=90, h=100	a=0, b=30, c=60, d=100
<b>Average of all sites (for max points):</b>							<b><u>100</u></b>	<b><u>100</u></b>
<b>SUM</b>		<b>200</b>						

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